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THE

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OF

THE LINNEAN SOCIETY

OF

LONDON.

VOLUME XXX.

PART THE FIRST.

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GARDEN.

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1874

M.DCCC.LXXIV.

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(Plates I–XVIII.)

Read February 17th, 1870.

THE Tree Ferns of British Sikkim belong to the genera *Cyathea*, *Hemitelia*, and *Alsophila*,—the former being represented by the only known species in India proper (the *C. spinulosa*), *Hemitelia* also by a single species (which seems to me new, the *H. decipiens*, n. sp.), and *Alsophila* by four out of the five known continental Indian species and two others which I do not think have been hitherto described. I thus recognize eight indigenous species; and it is interesting to note that these may all be collected in a three-miles walk from the bungalow on the Cinchona plantations at Rungbee. I need scarcely add that such specific concentrations of tree ferns are rarely to be met with in India. It is also noteworthy that while the temperate forests at elevations of from 5000–6500 feet abound in a variety of the humbler fern forms, two only of the nobler forms occur in these regions. What is therein wanting in variety, however, is largely compensated for by the number and luxuriance of individuals; and it is by no means rare to find both species forming extensive groves, in which are specimens from 40 to 50 feet in height, with undivided or branching stems and many-headed coronas of wide-spreading graceful fronds. The tropical species, on the other hand, are in general much isolated, from the extensive clearances of their habitats by the Lepchas for the cultivation of their maize, millet, eleusine, and other crops; so that along whole ranges of those mountain-flanks, the tree fern rarely greets the eye, and we must needs search for them in the deep recesses of their valleys, by the rocky forest-clad banks of rivers, and other uncultivable places. There are several such refuges in the lands reserved by Government for cinchona cultivation; and endemic to them, as I have above stated, are, fortunately for their

preservation, all the Sikkim species with which I have any acquaintance. These, I may state, have been all lately introduced to the Botanical Gardens, Calcutta; and nearly all are now thriving surprisingly in a lightly thatched structure, similar to those in use among the natives of various parts of Bengal for the growth of their "pawn" or betel-pepper. Simple though these structures be, they are most effective, and, indeed, indispensable, enabling us to grow satisfactorily these shade- and moisture-loving plants, which would barely survive a single day's exposure in the hot season of Lower Bengal.

The altitudinal distribution of the species is interesting, and in a few cases increases the range respectively affixed by Mr. Baker in his valuable contribution to fern-geography (*vide* Trans. Linn. Soc. vol. xxvi. pt. 1, p. 305). Taking the genera in systematic sequence, we have first the *Cyathea spinulosa*, which scarcely occurs above 2000 feet or descends below 1000 feet, though nowhere common, and decidedly one of the rarest of the Sikkim species. The Lepchas very frequently confound this plant with the next, *Hemitelia decipiens*, mihi, recognizing them under the name of "pŭgzheēk-nŏk," though those of them better up in plant-lore distinguish it under the names of "pănhjūm" and "pŭgzliōck." They resemble each other not a little in habit and armature, occurring also at similar elevations, though *H. decipiens* has a more extensive range, ascending to 3000 feet, and of frequent occurrence, especially in the valleys of the Rungbee and the Rungjo. At elevations of 4000 feet *Alsophila latebrosa*, the "pŭgzheēk" of the Lepchas, makes its appearance, becomes abundant at 5500 feet, ascending to elevations of 6500 feet and upwards, as on the birch-hill near Darjeeling. Within this range we have also an abundance of *Alsophila comosa*, the "păshīn" of the Lepchas, a species of wonderful prolificness, and forming, in its season of verdure, some of the prettiest and most extensive groves that are to be seen in Sikkim. Similar though these species are, however, in their altitudinal range, *A. comosa* is notably less widely distributed than *A. latebrosa*, which is first seen on the ascent of the hills from Punkabaree, and that in considerable abundance, on the banks of the Darjeeling road, below Kursiong, thence upwards to elevations of 6500 feet, encircling and more or less abundantly interspersed through the whole of these moist forest ranges; while *A. comosa* is rarely met with until the mountain Sinchal has been reached, when it is by far the more abundant of the two*. Associated with these are a few subarboreous species, and very many kinds of humbler form. The more conspicuous of the forner are *Angiopteris evecta*, which, at elevations of 6000 feet, attains most gigantic proportions †. The following are the measurements

* I may note that *A. comosa*, though extending through a very similar altitudinal range to that of *A. latebrosa*, thrives but indifferently in the Calcutta gardens, where the latter seems to be as much at home as in its native habitats. *A. comosa* casts its fronds early in our rainy season (the beginning of July, and fully a month earlier than in Sikkim), and remains frondless, and without the slightest effort to unfold a frond, until the cold season has fairly set in, in December, when one follows another in such slow sequence, that I fear, ere a single cycle has been completed, its season of rest and defoliation will have recurred; the many adventitious buds do not differ, having all remained frondless.

† This species is also found in the tropical forests, as in the valley of the Teesta, at an elevation of 500 feet; but scarcely attaining half the dimensions of those in the temperate forests; indeed the Lepchas distinguish them as the "big" and "little Tŭckbō."

of a plant of this species which Mr. Gammie was good enough to take for me. The plant was growing by the side of the Darjeeling and Rungbee road, at an elevation of 5000 feet; and, as Mr. Gammie remarks, there were many other specimens of larger dimensions in the interior of the jungle. The caudex was 2 feet 4 inches in height, and 2 feet 6 inches in diameter; stipes 5 feet 8 inches long, with a circumference at the base of 14 inches; frond 15 feet 8 inches in length, and 9 feet 4 inches broad; and the diameter from apex to apex of opposite fronds was 24 feet. These plants, abundant as they are in the forest ranges, are strikingly ornamental with their glossy dark-green fronds, and surprised me not a little when I first saw them at such altitudes, accustomed as I had been to see them cultivated in stoves at home. Under the latter treatment the stipes are more slender, the fronds less rigid, and the tissues altogether laxer, as is shown by a measurement of Mr. J. Smith (Ferns, Brit. and Foreign, p. 333), in which he speaks of a plant of this species at Kew reaching the height of 12 feet, spreading outwards, forming a diameter of 34 feet. There are several other handsome subarborescent species (*Diplazium maximum*, *D. polypodioides*, *D. latifolium*) abundant at the same altitude; and here also occurs, though somewhat locally, the magnificent *Gleichenia longissima* (*G. gigantea*, Wall.), with stout stipes, 8 to 10 or more feet high, interlacing themselves amongst low bushes &c., from which they send their large gracefully drooping fronds. We have also from this altitude, upwards to considerable elevations, the antique-looking *Sphæropteris barbata*, with its densely hoary-scaled stipes, and such other interesting kinds as *Nephrodium splendens*, *N. apicifolium*, and *crinipes*, and *Polypodium ornatum*, all handsome and striking objects in the undergrowth of the forests*.

The next of the tree ferns which we find in descending from these elevations are the *Alsophila ornata* and *A. contaminans*, the latter in two varieties. These occur at elevations of 3000 feet, and descend in the valleys of the Rungbee and the Rungjo to 1000 feet. *A. contaminans*, var. *Brunoniana*, is by far the most abundant of the tropical *Alsophilæ*; indeed I haveonly seen a single specimen of *A. contaminans*, var. *a*, in the Rungbee valley. *A. ornata* is also extremely rare, though (unlike its ally *A. Andersoni*)

* After an absence of two years or so from Sikkim, I was much struck on my return with the avidity (so to speak) with which several plants (previously rare in the extreme) had taken to the newly made cuttings of the forest-paths, and sprung up in abundance. Amongst others which struck me I may note *Sphæropteris barbata* and *Gleichenia longissima*, the former of which was one of the rarest plants on the mountain Sinchal, and the latter confined to a few localities. Now both will soon be amongst the commonest ferns of the mountain; everywhere above 5000 feet we find them springing up in abundance along the newly cut pathways. The most striking feature, however, was the many kinds of beautiful *Strobilanthi*, then in full flower, and converting miles of those forest-paths into matchless stretches of beautifully diversified bloom, though in the forest-interiors you might have searched everywhere and rarely found those species, and that only sparingly distributed in isolated groups of a few individuals. I wondered much, and still do wonder, therefore, how they are now so equally distributed along those miles of pathway. In the case of the ferns, whose spores are carried in every breath of wind, explanations are easy; but with the *Acanthaceæ*, whose seeds are alike too heavy for such a transit, and devoid of any apparatus for distribution by birds or animals, there is not a little difficulty. Clearly they could not have thus been dispersed (as we may presume the spores have been when conditions favourable to their germination presented themselves), but in all probability have been buried there for years, though we have difficulty in keeping them even for a few months by our modes of preservation.

it is not confined to these valleys, but is also found in the Khasia and Naga Hills. *A. Andersoni* is, so far as yet known, confined to the shadiest forest glades of the Rungbee and the Rungjo, where it is found at elevations of from 1000 to 2500 feet, and there by no means uncommon. It was first discovered by Dr. Anderson, Superintendent of the Botanical Gardens here, in 1867. I have therefore much pleasure in associating his name with one of the handsomest of the Indian tree ferns, and one which seems peculiar to those tracts on which, and in spite of all the many predictions of failure, utter unsuitability, &c. &c., he has nevertheless reared some of the most healthy, vigorous, and extensive Cinchona plantations that are to be seen in India*. *A. glabra* is the most strictly tropical of all the Sikkim species occurring in low tropical valleys, and nowhere ascending, I believe, beyond 800 feet. At this elevation, however, it is rare in the extreme, becoming more abundant downwards, and rather frequent in the moister parts of the Darjeeling Teraie. In passing through the Teraie, on the Ganges and Darjeeling road, I found in an adjoining thicket beyond Gareedhoora several handsome young specimens of this species from 4 to 8 feet in height, springing, with many others in less advanced stages, from a prostrated caudex. Beyond the Balasun river, in the south forests of the Dulka Jhar, I am informed by Dr. Anderson that it is very abundant.

The above species (exclusive of the two from the higher altitudes, which are, course, beyond the limits of successful Quina-cultivation) are found on the government-preserved Cinchona-lands; so that in Sikkim, as Humboldt informs us is the case in the natural habitats of the Quina barks, arborescent ferns are usually found associated with the tree which confers such benefits on mankind by its fever-healing bark. Both indicate by their presence the happy region where reigns a soft perpetual spring. ('Aspects,' vol. ii. p. 28.)

In the Darjeeling Teraie, beyond the region of the tree fern, the dwarf herbaceous species are also rare; and of the many which haunt the dripping forests above, a very few are now seen, and those no longer perennially verdant, but, comporting themselves in accordance with the changed condition, complete their annual growth in the rainy and cold seasons, and pass in a dormant frondless state the subsequent hot months.

The general unsuitableness of these tracts to fern-growth is thus patent to the least observant who have seen the many forms which everywhere meet the eye in the congenial forests of the higher altitudes. The list annexed comprises those of the dwarf species which descend below the tree-fern limits, and enrich the extra-Teraie fern-flora. I collected them in October 1868, within a radius of two miles from the Siligoree-Dack Bungalow.

* In the last annual Report I find that 610 acres were then under cultivation; and upwards of 600 more have since been added, all of which, as I know from personal observation, are studded, not (as is too frequently the case in Indian plantations) sprinkled with a few plants, merely with a view to increase acreage and, consequently, expenditure in keeping clear gaps of bare land.

Those marked * are all found in the vicinity of Calcutta.

Gleichenia dichotoma, *Willd.*
Dicksonia scabra, *Wall.*
Lindsaya lanceolata, *Lab.*
*Adiantum caudatum, *Linn.*
*—— lunulatum, *Burm.*
Cheilanthes tenuifolia, *Sw.*
—— varians, *Hook.*
—— farinosa, *Kaulf.*
—— argentea, *H., K.*
Onychium auratum, *Kaulf.*
*Pteris longifolia, *Linn.*
—— crenata, *Sw.*
—— aquilina, *Linn.*
var. lanuginosa, *Hook.*
—— biaurita, *Linn.*
*Ceratopteris thalictroides, *Brong.*
Blechnum orientale, *Linn.*
*Asplenium esculentum, *Presl.*
Nephrodium extensum, *Hook.*
Nephrodium pennigerum, *Hook.*
—— molle, *Desv.*
*Nephrolepis cordifolia, *Baker.*
*Polypodium proliferum, *Presl.*
*—— irioides, *Lam.*
*—— quercifolium, *Linn.*
—— punctatum, *Thunb.*
var. rugulosum, *Labill.*
Vittaria lineata, *Sw.*
*Acrostichum scandens, *J. Sm.*
*Lygodium dichotomum, *Sw.*
—— scandens, *Sw.*
—— pinnatifidum, *Sw.*
*—— japonicum, *Sw.*
Ophioglossum nudicaule, *L. fil.*
*—— vulgatum, *Linn.*
Lycopodium cernuum, *Linn.*
Selaginella imbricata, *J. Scott.*
—— semicordata, *J. Scott.*

The *Gleichenia dichotoma*, though very generally distributed in the tropical and sub-tropical regions of both hemispheres, and even extending to temperate altitudes, as in Sikkim, where it is found at elevations of 5000–6000 feet, is rarely seen in the plains of Bengal. In the present instance it is not at all uncommon, forming on dry banks near the Julpigoree road a dwarf rigid scrub (on which the goats browse) from 1 to 2 feet or so in height. In the moister and shadier localities adjoining, it ascends amongst the branches of shrubs to the height of 6 feet. In the latter habitats it is usually associated with *Dicksonia scabra*, *Lindsaya lanceolata*, *Lygodium dichotomum*, *japonicum*, and *scandens*. The latter species is especially abundant and extremely ornamental, completely enveloping many of the shrubs, and even small trees 20 feet in height. *Cheilanthes tenuifolia*, *varians*, and *C. farinosa* are locally abundant on many of the drier banks of the Julpigoree roads, occasionally interspersed with a few plants of *Onychium auratum*. *Pteris aquilina*, var. *lanuginosa*, I found only in the ruins of an old brick building near the banks of the Mahanudi. In similar habitats, *Polypodium punctatum*, var. *rugulosum* (which in all except the fructification so much resembles the last species), is by no means rare. *Ceratopteris thalictroides* is an annual, frequent in the rainy season in excavations by the sides of the roads &c.; and very frequently the banks of these are covered with the drooping branchlets of the *Lycopodium cernuum*, and more rarely with patches of the above-named *Selaginellæ*. Both the latter are strictly plants of the rainy season, or at least disappear early in the cold season. *Ophioglossum nudicaule* seems to be an exceedingly rare plant, and was found by me only on dry sandy banks near the Mahanudi. *O. vulgatum* (if really distinct from the latter) is of more frequent occurrence in moist and shady lands. These plants, however,

appear to me very doubtfully distinct, and to merge into one another as they pass from moister to drier habitats, so that they are with difficulty separable.

Economic Uses.—The central cellular parts of the stems of three species of the Sikkim tree ferns are eaten by the Lepchas in times of scarcity, when other and more palatable food cannot be obtained; and when their favourite "mūrwah" fails them, they extract from the tree ferns also a similarly intoxicating drink. The preparatory process is as follows; and the species used are *Cyathea spinulosa*, *Alsophila comosa*, and *A. Andersoni*. They first strip the caudex of its hardened rind-like substance and the woody laminæ, and then cut and slice into small pieces the central cellular interior, which they then boil for an hour, apparently with the view of expelling the tannic and gallic acids, which are always more or less present, and then steep in cold water for about twenty-four hours, when it is placed on a plantain or other large leaf and thoroughly dried in the sun, so as to preserve it as required for use. Some eight or ten days previous to its being required it is mixed and fermented with about one third of its bulk of boiled rice, when, as in the case of the "mūrwăh," it is placed in the joint of a bamboo, filled up with warm water, and sucked through the slender branchlets of a bamboo. This moisture is called by the Lepchas "rŭckshiē," and is said to be even more intoxicating than the mūrwăh, though they much prefer that. It is therefore chiefly used (as Mr. Munro, of the Cinchona plantations, Poomang, informs me) in the early part of the rainy season, when their old murwa grain is done, and their new unripe. It is noteworthy that they will not eat nor extract the "rŭckshiē" from the cellular matter of the *Alsophila contaminans*, var. *Brunoniana*, though it is entirely free from the woody bundles, which are the only reason they assign for not using the *Alsophila latebrosa* and *glabra*. They assure me that the pulpy matter of *A. contaminans*, var. *Brunoniana*, when eaten, causes nausea, vomiting, and purging, with griping and distention of the stomach. Such at least is the account given me by our Lepcha plant-collectors and one or two other of their sirdars: anyhow it must possess some noxious quality or another; otherwise the Lepcha would not trouble himself by a hill-ascent of some 4000 feet for *A. comosa*, when he might have an abundance of the other species in proximity to his dwelling. The *Angiopteris evecta* is another species used for food by the Lepchas, much as they would a yam, by slicing and roasting in ghee. They recognize two varieties—one in which the interior of the caudex, stipe, and stipuliform appendages is of a light pinky red, and the other in which it is a dull greyish white. In no other characters, however, do they present any differences, so that even the Lepchas, accustomed to gather them from their infancy, can only distinguish the two by cutting the caudex. I may remark, however, that these colour-differences do not arise, as might be suspected, from their frequenting different habitats, as both grow intermixed; and the characters are presented alike on young and old individuals. The red variety is called by the Lepchas "Tŭckvōō," the white "Tŭckvōō-dōōm." There are a few others of the dwarfer and subarborescent species, of which they use the young fronds as vegetables in their curries, &c. *Botrychium daucifolium*, which is exceedingly luxuriant in many parts of Sikkim at elevations of from 3000 to 5000 feet or more, is similarly used, as noticed by Dr. Hooker. This species has also (as its congener *B. Lunaria* had in Scotland in olden times) magical virtues ascribed to it; and on certain days the

Lama, or high priest of the Lepchas, has the interior of his temples and altars strung with moonwort for one or other of his gods. The Lepchas also, like many other of the natives of India, cook the insipid tubers of *Nephrolepis tuberosa*—the poorest fare of all, and one certainly on which man or beast will be more likely to die than live. The Lepcha, however, in his native forest, would scarcely starve, so well does he know the qualities, and so readily can he pounce upon the more or less nutritious roots, the pulpy stem, leaves, or seeds—a knowledge evidently acquired by hard experience, and transmitted from generation to generation. It seems, indeed, with this race, a parent's first duty to acquaint his child with the products, nutritious and noxious, of his native forests; and the aptitude with which they acquire this knowledge is truly surprising, and rather the result of the operation of instinct than that of experience or previously acquired knowledge through the senses. Anyhow the necessity of circumstances stimulates the acquirement of such knowledge, and well supports Mr. Darwin's view, that from innumerable experiments made through dire necessity by the savages of every land, with the results handed down by tradition, the nutritious, stimulating, and medicinal properties of the most unpromising plants were probably first discovered.

Anatomy of Caudex.—The following remarks under this head, though possessing but slight claims to originality, will, I have thought, be of some service in their negative or affirmative relations to the statements of other observers, which are in several points very conflicting and still, in fact, *sub lite*. Thus, according to Mirbel, the caudex consists of "a simple fascis of petioles or leaf-stalks" (Elémens de Phys. Végét. i. p. 121), an opinion indorsed by Lindley, Balfour, and others in their class-books; while Schleiden considers what he terms the attempt "to represent the stem of the fern as merely composed of leaf-stalks grown together, is so entirely at variance with the law of its development, and consequently so totally devoid of foundation," that he does not deem it worth while to contest the point. "Germination," he continues, "shows that there is a rudiment of the stem prior to the formation of the leaves and leaf-stalks" (Schleiden's 'Principles of Bot.' p. 197). Less decided though apparently similar opinions are held by Mohl; so also Hofmeister, in his paper on the development of *Pteris aquilina* ('Higher Cryptogams,' p. 225), remarks that "the distribution of the vascular bundles in the unbranched frondless ends of shoots exactly corresponds with that of the frond-bearing stem, a convincing proof that the arrangement of the vascular bundles in the stem is not dependent upon the position of the appendicular organs, or the number and form of the bundles occurring in such organs."

With reference to the mode of ramification of the stems of ferns there is also a difference of opinion. Brongniart, Hofmeister, and others confine normal ramification to the bifurcation of the apex of the stem above the youngest frond of the bud, and explain the frequent lateral position of one fork of the branch by the more vigorous development of the other. This is the lateral bud ramification of Hofmeister as distinguished from normal dichotomy, in which there is an equal development of the bifurcated apex of the stem; while adventitious buds are such as make their appearance underneath the insertion of the youngest appendicular organ, whether on the outer surface or in the interior of the tissue. This view is, of course, perfectly accordant with

the frequent definite relations between the positions of the branches and fronds of the main axis. Karsten and Mettenius, having regard to those positional relations of the branches and the fronds, do not consider that the ramification of ferns is in any respect different from that of phænogams, both originating in the development of lateral buds, which have a definite positional relation to the appendicular organs. This opinion Mettenius supports by the occurrence of what he considers truly axillary buds in various species of *Trichomanes*,and the variously posed infra- or extra-axillary buds of the *Davallieæ*. Under the same category Mettenius places the buds found on the stipes of *Pteris aquilina* and *Aspidium Filix-mas*, though these are evidently, as Hofmeister remarks, "adventitious buds distinct from the true ramifications of the stems." The real difference between the views, then, resolves itself into the question whether the bifurcation of the caudex, and the genesis of buds at the base of the stipes, are cognate phenomena, and relatively to the main axis analogous to the axillary buds of phænogams. Hofmeister replies in the negative, and supports his position by various arguments, which I shall subsequently notice.

The general structure of the caudex has been skilfully treated by Mohl (*vide* Martius, Ic. Plant. Crypt. Bras. p. 40.); but as there are still differences of opinion, as I have above shown, on several important points, and others in which there seems to me a general misconception, I have taken advantage of the opportunities afforded me in the Sikkim forests to secure stems of the various species; and the result of my examinations of these I now beg to submit to this Society.

The structure of the caudex is pretty clearly illustrated in the accompanying drawings. Of these I may first refer to the various transverse sections shown on Plates I., II., & III. The section of *Alsophila latebrosa* (Pl. I. fig. 2), from a newly cut stem, presents a large central mass of parenchyma, in which are imbedded a number of isolated fibro-vascular bundles, with a triple series of sinuous woody laminæ on its periphery, and externally encased in a sort of hardened rind. In fig. 4, it will be observed that the number of the large isolated woody bundles in the central cellular axis is greatly reduced, and indeed chiefly confined to the periphery, while in Pl. II. fig. 4 they are entirely absent. So also we find variations presented in the degree of continuity of the woody laminæ, each loop corresponding to the origin of a frond. This character, however, unlike those of the isolated woody bundles, is by no means specifically characteristic, but variable even in the same individual, and largely dependent on the health of the plant, and of course on the angular divergence of the frond. This is well shown by reference to Pl. IV. figs. 1, 2, & 3, representing three sections of *Alsophila contaminans*. Fig. 1 represents a section at two feet from the base, and presents only three plates arising from $\frac{1}{3}$ frond-arrangement, while in fig. 2, of a reduced section at 8 feet from the base, there are five distinct plates corresponding with a $\frac{2}{5}$ angular divergence of the fronds. The section from the dried stem (fig. 3) exhibits the peculiar W-like laminæ as generally represented in botanical manuals, and, as in fig. 2, is characterized by a $\frac{2}{5}$ frond-arrangement. The additional V-shaped lamina is simply a result of the contraction of the cellular parts. The disjunction occurs in the line of origin of a new frond in the lamina *a*, before a union has been effected with the adjoining lamina *b*. Mohl, in his treatise

referred to above (tab. xxix. fig. 2), gives a section of the stem of *Alsophila excelsa* of an octangular outline, which I have never seen any fern assume. This section presents a noteworthy peculiarity also in the peripheral line of large isolated vascular bundles, which occur in none of the specimens that have come under my observation. I suspect, however, that, though in no way distinguished by Mohl from normal woody bundles, they are merely isolated masses of parenchyma, such as we often find dried sections presenting, and, indeed, partially illustrated in the section of *Hemitelia decipiens* (Pl. I. fig. 4). This receives a further confirmation by reference to the magnified portions of the above section (Mohl, tab. xxxii. figs. 1 & 2), which present no vascular tissue in the corresponding stratum.

The soft central mass consists of parenchyma, interspersed (as in Pl. I. fig. 2) more or less with, or nearly destitute of, isolated vascular bundles. These bundles present externally a layer of hard brown pleurenchyma, succeeded by a layer of soft parenchyma, which surrounds a trachenchymatous axis. With regard to the development of these bundles, the generally received opinion (in unison with the theoretical distinction of acrogens) is, that they grow from below upwards, and never in any case extend below the point at which they originated. This opinion, however, by no means agrees with my observations, throughout which I have invariably found that they originate partly from the axial tissues in proximity to the hard brown diaphragm of the frond, and partly from the margins of the meshes in the woody laminæ at the point of origin of the latter. This is very clearly demonstrable by examination of the nascent fronds of *Alsophila ornata* and *latebrosa*. The transverse section of the apex of a caudex of *A. latebrosa* (Pl. III. fig. 3) shows the structure and arrangement of the young fronds. Now, in examining these, we find as we pass from those on the periphery to those in the centre the number of free vascular bundles decreasing, and wholly disappearing in the younger or nascent fronds—a result, of course, equally accordant with either view of their origin. Longitudinal sections, however, afford us conclusive evidence, showing the vascular bundles in various stages of development (and, as they appeared to me, always younger and less perfect towards their respective extremities) in the young frond and parenchymatous axis. In their centre, or line of separation of the frond and the caudex, they consist of parallel lines of trachenchymatous tissue, surrounded by thin elongated cells, which pass by a gradual transition into the ordinary parenchymatous tissue of the stem, as in their upward growth they pass by a similar transition into the cellular tissue of the rachis.

As supporting the view I have taken, I may further remark on the comparative absence of the bundles from the apical part of the stem, and the non-appearance of any such in an upward course of development. In all cases in which I have been able to trace them to their extremities, I have invariably found a developing apex below and a more perfectly developed tissue upwards, passing into a stipe. Furthermore, I have in no instance observed upwardly-developing ramifications from lower bundles, which evidently should have occurred had the theory of development from below been correct, whereas all seem to me confirmatory of the opposite view, and point to the inosculations of descending bundles. In *A. latebrosa* the free vascular bundles are

considerably more elongated and less disposed to ramify and anastomose than are those of *A. glabra*, so that, as shown in the above-noted plates, their examination is much simplified. Those bundles from the fully matured fronds I have frequently found to have a downward extension of from 12 to 18 inches and upwards, while those from the younger fronds are always much shorter, indicating a certain reciprocity of development. I am of opinion that the downward development of the bundle is continued until the frond is fully matured. But for such a limitation to the development, the lower parts of the stem would have been much more crowded (and, indeed, ultimately filled) with the descending bundles. This is not the case; and reflecting on the above relations between the development of the younger and older fronds and their respective vascular bundles, I consider myself justified in holding the above view of the limitation of the growth of the latter.

As further supporting the view of an inverse or polar development of the free vascular bundles, I would also direct attention to the very marked difference in the ramification of the bundles in the caudex and those in the frond. In the latter they are arranged in various planes with an almost specific regularity, agreeably to a correlated development with the other part; whereas in the former we find them distributed in a most irregular and complicated manner, which appears to me only explicable when we consider them developed subsequently to the parts in which they are found. Certainly, had they originated at their lowest point (which must have always been in proximity to the growing-point, as shown by their appearance in the nascent fronds), and undergone development with the other parts of the caudex, they must necessarily have extended in nearly straight lines between their points of origin and attachment to the diaphragm of the fronds, which, as I have shown, takes place in their earliest stages of development.

Schleiden, in criticising Martius's views on a similar development of the vascular bundles of Palms (Principles of Botany, p. 258), remarks "that he [Martius] has left the meaning of the term onward growth of a vascular bundle equivocal. If it means that the already existing elongated cells become transformed into vascular bundles, it describes no peculiar process of growth; the vascular bundles were already to be distinguished in their elementary condition: but if it means that the cells themselves of which the vascular bundles are composed are produced subsequently, originating above first, and proceeding downward, this is, I believe, erroneous." If, as Schleiden states, Martius has expressed himself ambiguously (though I can scarcely doubt that his language implies other than an organizing force at both extremities), Gaudichaud distinctly states that their development commences in the centre, whence an ascending and descending portion are gradually organized (*vide* Recherches gén. sur l'Organographie, &c. 1841). Schleiden, in opposition to such views, maintains (and is supported by Henfrey and others) that the lower extremity of the vascular bundles indicates the point of origin, whence they grow upwards only into the leaf. From my own observations on the stems of the various palms which I have had an opportunity to examine here, I am convinced that both of the above views require modification, and that a portion only of the woody bundles develops from both extremities, while in the others

growth is confined to the upper extremity; so that we have exemplified in them both the simultaneous and definite modes of vascular growth. This will be best explained by reference to the supplemental plate which I have added, showing a vertical section of *Euterpe olivacea*. The youngest or nascent leaves are in this wholly composed of cellular tissue; and it is by no means difficult to trace the origin and development of those vascular bundles characterized by growth at both extremities. The first indications of these are to be found in the younger leaves in the form of parallel lines of elongated cells continuous with others similarly characterized in the stem, which by graduated stages of development pass in the older leaves into the normal vascular bundles. These appeared to me to have their origin on the summit of the stem, on lines corresponding with the axis of the leaves, whence they grow upwards into the leaf and downwards into the stem. These are the analogues of, though differing in structure from, the free woody bundles of the Fern stem. In all the Palm stems which I have examined (*Areca gracilis* and *Catechu*, *Euterpe edulis*, *Arenga saccharifera*, *Caryota urens*, *Borassus*, *Livistona*, and *Cocos nucifera*), I find a further concordance in the course of these bundles in the stem, which, proceeding from the base of the fronds, pass more or less into the central parts of the stem, though by no means at a uniform angle, whence with a slight outward curve they pass down and insinuate themselves in a more or less parallel manner amongst the adjoining bundles. In none of the many sections I have made, however, could I find any traces of that regulated curving or spiral turning of the bundles, which is usually represented in diagrams of the Monocotyledonous stem. Henfrey has remarked in his interesting paper on some points in the structure and growth of Monocotyledons (Ann. & Mag. Nat. Hist. vi. p. 183), "In speaking of crossing, it must always be recollected that this term is used rather loosely, as the upper bundles take very variable courses to get to the outer sides of the lower ones .... so that it is only here and there that a section will exhibit a direct crossing like that usually shown in diagrams." This is, no doubt, quite correct so far as a continuity of the individual bundles is concerned; but it fails to show *why* in every section of a palm-stem (at least in all that I have made) the fibro-vascular bundles are seen passing from the fronds towards the centre, but none passing thence to the periphery: manifestly if such had been the arrangement, every radial section of any length ought to have shown at least portions of the bundles on both courses, which they certainly do not *.

* The remarkable and frequently sudden enlargement of the caudex of certain palms towards the middle has been frequently remarked by travellers in the tropics. Various illustrations of this have been given by Martius in his great work, as also by Wallace in his more accessible and interesting treatise on the Palms of the Amazon. In the Indian species this bulging tendency seems to be developed in no very marked degree, and, so far as I have observed, confined to the Arecineæ. Several of our garden specimens of *Oreodoxa regia* and *Euterpe edulis* exhibit it in a more or less marked manner, and afforded me materials for the following observations. The finest specimen of *Oreodoxa* here is over 70 feet in height, with a basal girth of caudex of 92 inches, tapering upwards to 63 inches at 5 feet, whence it thickens upwards to 68 inches at 8 feet, to 78 inches at 10 feet, thence undiminished to the top. Now looking at such a specimen, it is impossible to offer a hint as to the probable cause for the enlargement. Young specimens, however, as it appears to me, are more suggestive. Thus in looking over a long avenue of these, in height (caudex) varying from 4 to 8 feet, I observed a few with very marked enlargements at about 4 feet from the base, while the others tapered gradually from the base to the top. To illustrate, in one specimen the basal cir-

The development of the vascular bundles composing the woody framework and surrounding the central cellular axis of the fern-stem, unlike that of the free bundles, is limited to their upper extremities. In a transverse section of the apical parts of the stem (*vide* Pl. II. figs. 1 & 2) the woody bundles are arranged in a more or less regular spiral manner, on an expanded, nearly horizontal surface, in oval-ellipsoidal figures (indicating the points of origin of the future fronds), passing towards the periphery in the lower sections into sinuous plates. In tracing the development of this portion of the stem, we find that the generation of cells has but limited radii, and that, towards the periphery of the flattened apex and before its incipient parts have assumed their lateral position on the stem, all increase is by simple expansion of the already formed cells, which become from four to seven times as large. It is only by this increase (caused by cell-expansion) of the bulk of the pith, remarks Hofmeister, that the net of vascular bundles is lifted up by degrees and projected upon a cylinder. It is easily seen, by counting the cells during and after the transition of the net of vascular bundles from the form of a paraboloid to that of a cylinder, that the increase in thickness of the stem is not caused by any subsequent new formation of parenchymatal cells, either within the pith or in the neighbourhood of or between the rudimentary vascular bundles (Higher Crypt. p. 231). The vascular bundles surrounding the apertures of the incipient fronds,

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cumference (which, I may remark, acquires in nearly all palms a considerable increase from the numerous adventitious roots to which it gives origin) was 50 inches, 21 inches at 3 feet, and 18 inches at 4 feet, thence cylindrical to the top. Again, in a second specimen the basal girth was 52 inches, decreasing to 23 inches at 4 feet, and again somewhat suddenly increasing to 27 inches at 5 feet, thence cylindrical. Now in regard to the first specimen (as to all those in the avenue with unbulged caudices), it had been thus far infertile, while in the other spadices had been produced, and that where the caudex first undergoes an enlargement. The spadices are henceforward produced with great regularity from every axil, the caudex increases in thickness to the point of origin of the sixth or seventh spadix, where it seems to attain its normal diameter, and is continued cylindrically upwards. It thus appears to me that the bulging of the caudex is due to the additional development of woody bundles from the spadix; and I am disposed to attribute such sudden enlargement as those of *Iriartea ventricosa* to periods when every axil gives origin to a strong and vigorous spadix, and, on the other hand, the decrease to their frequent abortion. I have further to remark that gouty stems have been observed only amongst the Arecineæ, and confined to species with markedly developed internodes, long sheathing fronds, and almost stem-encircling footstalks of spadices. In the other tribes (Borassineæ, Coryphineæ, and Cocoineæ) the ligulæ are short, the petiole at once passes off, at a less or more acute angle, from the caudex, the internodes are in general very slightly developed, and the spadices by no means originate from every axil; the non-enlargement, however, in these cases may be connected with peculiarities in the development of the woody bundles of the spadix in the undeveloped internodes (*vide* Schleiden's 'Views on the Stems of Palms'). Again, in the Coryphineæ with terminal inflorescence the caudex is cylindrical throughout, and so also in *Caryota* and *Sagus*, with centrifugal inflorescences and monocarpic caudices. I may be wrong in the above views; yet, in reviewing my little acquaintance with palms, I can recall no really disproving facts.

A few years ago there were several little communications to some of our monthly botanical and horticultural periodicals on another interesting phenomenon of palms. This was the production of an audible report in the bursting of the spadix, in which much was said for and against; and, if I mistake not, it yet remains *sub lite*. Without pretending to settle the question, I may at least be permitted to cast my vote, which certainly is that spadices do not produce any report when bursting—further, that in those cases in which I have attended to it, *Cocos*, *Oreodoxa*, *Euterpe*, and other Arecineæ, the anthers do not reach maturity for several days after the splitting up of the interior face of the spadix, which is further a gradual process, and sometimes extends over four days. The disarticulation of the spathe does not differ, either as to the cause or mode, from the fall of any other articulated organ.

which seem in the transverse sections to have an isolated position, have not really such, as will be seen by a reference to the longitudinal section of *A. glabra* (Pl. V. fig. 2), in which the woody laminæ are continued upwards and along the flattened apex. At this period of development the structure scarcely differs from that of a young Dicotyledonous stem, with which type they further agree in undergoing a certain degree of lateral development, until all unite and form a simple tabular circle with spirally arranged lozenge-shaped openings, enclosing a central parenchymatous mass, and enveloped in a cellular rind. There, however, the analogy ceases; and the vital activity, no longer directed to the lateral development in the periodical addition of layers (as in Dicotyledons) to these closed portions, is continued upwards in newer cycles. A lateral and a front view of the woody framework of *A. latebrosa*, prepared by maceration, is shown on Pl. III.; and I have also given, by way of comparison, sections from the stem of *Asplenium esculentum* (Pl. XII.). The latter presents a more or less regular series of lozenge-shaped meshes, from the lateral angles of which two vascular bundles pass off into the fronds. In the stems of tree ferns the woody framework is much more largely developed, and a numerous series of branches proceeds from the *whole margin* of the *ellipsoidal* spaces for the supply of the fronds, and is not limited, as in the herbaceous species, to the anastomoses of the main bundles. It will also be observed, by a reference to Pl. III. fig. 4, that these lateral or frond-bundles pass off from the main framework in an isolated-cylindrical state, rarely dividing again as they penetrate the diaphragm of the frond.

The arrangement of the woody tissue in the stems of the dwarf herbaceous species is, as might be expected, much less regular than in those of the arborescent species. The irregular distribution of the former is well shown in the various sections of *Asplenium esculentum* represented in Pl. XII. These differences in the distribution of the woody tissue in the dwarf and arborescent species are no doubt due to the inverse relations, pointed out by Spenser, between the formation of woody tissue and the subjection to mechanical strain. This seems to me borne out by the fact that individuals of the same species when frequenting different habitats—for example, the *Asplenium esculentum* above referred to, which indifferently occurs on dry banks and old walls, or under the deepest shade (in ditches and by the sides of tanks)—present considerable differences in the degree of development of the woody tissue, those presenting the greatest amount of the latter being invariably the individuals from the deepest and most sheltered habitats. In the arborescent species we also find considerable differences: in the individuals from dense forest-clad ravines the woody laminæ are decidedly thinner and interposed with thicker layers of parenchyma, the arrangement of the fronds becomes less regular, and the interspaces are frequently greatly increased. The sections of *A. contaminans*, represented on Pls. IV. & IX., show this in a very marked manner. The latter of these, with the distantly arranged fronds, oblong scars, with irregularly distributed inner vascular bundles, is drawn from a living specimen in the fernery of the Botanic Gardens, Calcutta, and presents a striking contrast to the symmetrically arranged quadrate scars and arcuately distributed vascular bundles which were afforded by the other section of a specimen which I cut on the Poomong Cinchona-lands (Pl. IV.

fig. 3). The plant grew amongst moist rocks, comparatively free from all other arborescent vegetation, and unsheltered from sun and winds.

The distribution of the vascular woody bundles in the stipes of tree ferns has also very evident relations to mechanical conditions. In the sections of the different species represented in Pl. VII., the woody bundles form rings concentric with the periphery of the stipes, with either rafter-like strutts passing off at an acute angle from the upper sides towards the interior, or somewhat irregularly distributed towards the upper periphery, but in either case increasing the strength of the upper planes. Now in the large horizontal spreading fronds of ferns it is evident that the greatest pressure will fall upon the upper side, so that the above arrangement perfectly accords with the mechanical conditions. In the sarmentose and rhizomatous species similar relations are obvious, the development of woody tissue in these organs having generally an inverse relation to the fronds which they support; and they are very markedly influenced by habitat. Thus *Polypodium phymatodes*, when growing in its indigenous habitats, has a much-hardened parenchymatous stem, studded in the central parts with slender woody bundles, and a ring of larger bundles near the periphery. In culture, under shade, it becomes softer and less tenacious in all its parts. So also the sarmentum of *Acrostichum scandens*, which has a a central pith-like substance surrounded by a layer of woody matter and an excentric ring of unequal-sized woody bundles (the larger corresponding to the sides applied to the shoots around which it winds, and of course that of greatest pressure), with a more slender peripheral ring of the same imbedded in an extremely tenacious parenchyma, which again becomes comparatively soft in individuals grown under shade and shelter. I know of no better illustration of this hypothesis than that afforded by the *Dipteris Wallichii*. This species has a hypogæous freely ramifying rhizome, rarely more than half an inch in diameter, with large stout-textured flabelliform fronds (posed in vertical planes), sometimes 30 inches in length and 40 inches broad, supported on slender tapering stipes upwards of 4 feet in height. To support and counteract the strain of such a frond demands considerable strength in both stipe and rhizome, so that what they decidedly want in thickness must be supplemented by density and tenacity: and so we find it to be. The rhizome is separated into four distinct parts—first, a central medullary parenchyma, encased in a thin ring of woody tissue, which is again surrounded by a thick layer of woody-textured parenchyma (corresponding to, though of course essentially distinct from the wood of Dicotyledons); and enclosing all is a hard scaly rind. The fronds are uniserial on the upper side of the rhizome, and somewhat distant, while the slender wiry roots are indifferently produced from its whole surface, though most abundantly from the underside. The species affects social habits, and is usually found in large patches, thus affording in a partial manner a mutual protection and support. It is evident, however, that even under the most favourable natural environments, the support of such large and heavy fronds (which even in the dry state weigh three ounces and upwards), with the root-fixments to balance their leverage, would be but imperfectly secured by an ordinary amount of woody matter in those slender stipes and rhizomes; and I do regard the remarkable increase as a direct result of frond-tension. That the rhizome and stipes should not have undergone

a similar increase laterally is, I believe, due to the flabellate venation, which radially concentrating the organizing force in the frond, thus demarcates and limits the growth of the stipe in a much more decided manner than is the case in fronds with laterally developed segments, in which the stipe blends into the rachis *.

I may in this place cursorily refer to the opinion that the trunks of tree ferns are hollow when fully formed, as stated in most of our botanical class-books. I can scarcely think that this is founded on observations of living or at all fresh specimens, but that it rather has an origin in the examination of dry museum specimens, which are then of course hollow. I at least have seen no such appearances in the many tree ferns I have seen growing in their native habitats. On the contrary, I have found, as shown in Plate I., representing the basal portion of a trunk of *Alsophila latebrosa* 7 feet high, that there is a greater tendency to consolidation by the descent of woody bundles from the fronds than to any rupturing or hollowing of the internal parts, throughout which at least a passive vitality is long continued. There is this, however, to be said, that species vary much in the tendency to throw out adventitious roots (*e. g. Hemitelia decipiens* has those roots confined chiefly to the base of the stem, while under the same conditions in

* A cognate and, in my opinion, very excellent illustration of the influence of mechanical actions on the formation of wood is presented by those huge buttresses which we find so common in many of the timber- and other trees of India. Probably the Paddlewood of Guiana (*Aspidospermum excelsum*), the Logwood (*Hæmatoxylon campechianum*), &c. have a like origin; and I do not doubt that the degree of fluting will be found to vary in individuals with their mechanical and physical conditions. But that this is the case with Logwood I have evidence from the plants in the Calcutta Botanic Gardens. I may particularly mention the Teak tree, *Tectona grandis*, the value of which is much deteriorated by this buttressing process, which seems to me not a specific, but rather a local characteristic. In the Botanic Garden here the buttresses are generally large in proportion to the diameter of the trees; and we find the roots in no case deeply penetrating the soil, but distributed in a horizontal manner near the surface—a result, no doubt, of the saturated state of these alluvial clays from June to November, which are so little above the water-level as to render drainage impracticable. Even in those conditions, however, Teak springs up with a wonderful rapidity and vigour, indicating that, for the production of first-class timber, drainage is alone wanted, to induce a deeper penetration of their roots, reduce the size of the buttresses, and render them less liable to be uprooted in the storms which of late have so frequently visited these parts. The buttresses are thus, in my opinion, simply an effort of nature to complement the stability lost in the distribution of the roots near the surface of the soil; and as further confirmation of this, we find individuals with deeply penetrating roots comparatively free from buttresses and with plane unfluted boles. The accordance of this with the above views is evident when we consider the respective mechanical conditions. Thus in those with roots more or less acutely penetrating the soil, there will be an inverse merging of the axis of resistance in lines concentric with the main axis of the tree, and a consequently graduated equality in the develpment of the woody layers as afforded by the plane and rounded boles. Again, in those with roots diverging at obtuse angles, there must necessarily be an isolation in the strains or resisting axes, each root forming, as it were, an independent *point d'appui*, and the consequent result will be an increased development of woody matter in axes continuous with those of the roots, decreasing upwards with the convergence of these axes. This accords with the phenomenon in question—buttresses do decrease upwards, and blend in a more or less plane and rounded surface. I have also observed that trees with branches diverging at more or less acute angles from the main trunk are generally more strongly buttressed than those with stout horizontal spreading branches, the mechanical explanation of which is, of course, that the weight and force of the wind on the main axis must be considerably less in the latter than in the former condition. As further illustrating this mechanical theory, it is noteworthy that the buttresses of a tree are rarely (I believe, never) directly opposite, as might have been expected had their production been simply a question of nutrition; furthermore, in the Botanic Gardens here—I have not particularly noted this point elsewhere—the largest buttresses are, or rather were (for the cyclones have left us few to look at) on the side of the prevailing winds.

Alsophila ornata and *contaminans* they form a dense mass extending high up the stem), and that in the *densely rooting species* there is a *greater tendency* to a general decay of the lower parts; but this is, again, only when a massive basis of adventitious roots has all but neutralized the strain on the base of the stem. Anyhow, I may state that in no case have I seen the interior decay in uninjured specimens extending a foot above the ground-level.

Ramification of Stems.—Ramification of the caudex of tree ferns is occasionally produced by the suppression of the terminal bud, more frequently by the development of adventitious buds. Hofmeister, as I have stated in my prefatory remarks, further divides the former mode into those in which the bifurcations are equally developed, and those in which one of the forks forms the principal axis and gives to the other a lateral position. To the former he applies the term Dichotomy; the latter he distinguishes as lateral buds. The application of the latter term in the sense mentioned is apt to mislead; and indeed the distinction appears to me superfluous. Practically these so-called lateral shoots are ultimately in many cases undistinguishable from those having an adventitious origin. Hofmeister, indeed, maintains that there is a "real difference between the internal structure of the forked branches of the stem, and that of the place of junction of the principal stem with the buds which I have regarded as adventitious and seated on the stipes. The former exhibit throughout their entire length the peculiar structure of the stem, while the collar of the latter, on that part between the principal axis and place of origin of the bud, exhibits the characteristic arrangement of the vascular bundles of the stipes" (Hofmeister, 'Higher Cryptogams,' p. 266). Differences in the internal structure of the two forms of buds are by no means and in all cases thus easily distinguished; and certainly in the buds of tree ferns which have come under my observation I have in no case found such distinctive characteristics as the above; adventitious buds, though presenting a structure somewhat akin to that of the stipes in an incipient, have little in common with them in the mature state. I have examined many of those buds in nearly every stage of development on the *Alsophila gigantea* and *comosa*, both of which are singularly prolific. In both these species the adventitious buds most frequently occur on the outer base of the stipes, though they are by no means rare on the interspaces between the fronds. Now these differently posed buds present differences in structure—the former directly communicating with the interior of the stem, through the frond-meshes, while the woody laminæ are interposed in the latter. These *stipal* buds, being thus manifestly in a very similar relation to the main axis as are the *displaced lateral axes* of the forked end of stems, a considerable similarity in structure might be justifiably assumed. This is confirmed by observation. Differences in the developmental force of the axis of a fork are generally manifested in the incipient stage: growth is more or less completely suppressed in the weak axis; the latter is forced out on the side of the stem, and presents a contraction at the collar (*vide* Pl. X. fig. 2) similar to that of adventitious buds, from which it scarcely differs in structure. The disguise is thus in many cases very complete, so much so that a long-latent and subsequently developed main axis is only distinguishable from the adventitious buds by its more complete and direct union with the interior woody framework; and even this is also much disguised when a

vigorous bud is developed on the young and *softer parts* of the *stem*. With all this similarity of structure, however, there can be no question as to their affinities (as urged by Hofmeister) being other than analogical, and that they are distinct from each other and the axillary buds of phænogams. Their homology with the latter organ has been suggested by Karsten, and espoused by Mettenius. The latter author has endeavoured to support this view from the apparently axillary partition of the buds in several species of *Trichomanes*, and the transitional condition of those in certain *Hymenophylla* and *Davalliæ*, which, with axillary buds, have others spinging from the upperside of the superposed frond. These are but isolated instances, however, and in my opinion are casual relations, inasmuch as we find in both *Trichomanes* and *Davallia* axillary buds on certain portions of the rhizome, while others are irregularly posed on various parts, and by no means confined to the line of the fronds. Moreover, in many cases, those buds are truly the result of bifurcation of the main axis; and as such there is no reason why they might not be occasionally subtended by a frond, and so assume an apparently axillary character. This is by no means a rare phenomenon in the erect tufted caudices of *Trichomanes javanicum* and in some of the Indian sarmentose species; in the latter, buds (the results of bifurcation) appear on the frondless end of the stem, and have not unfrequently an axillary relation to a subsequently developed frond.

In the proliferous tree ferns buds most frequently occur on the exterior base of the stipe, and, though not uncommon (as in *Alsophila comosa* and *glabra*, vide Plates X. & XI.) in various extra-axillary positions, I have never observed them in the axil of a frond. The *Alsophilæ* referred to are remarkably prolific, and, singularly enough, occur in the extremes of altitudinal range of the Sikkim species, viz. *A. glabra* in low tropical valleys, while the habitats of *A. comosa* are the temperate forests. In the normal conditions of growth of the above species a varying number of adventitious buds are always being produced; but for a full exhibition of their wonderful prolificness it is necessary to examine plants which, through some cause or other, have received a check in the development of the main axis. I was much struck with this in an uprooted plant of *A. glabra*. This plant I found on the banks of a mountain-steam near the Ganges and Darjeeling road, in the Sikkim Teraie, whence it had no doubt been brought from higher elevations while the stream was flooded, as no other plants of its kind were to be found in the vicinity. Anomalous, therefore, did it appear to observe in a single uniform line of 15 feet, *twenty-three* young plants of *A. glabra*, varying from 6 inches to 4 and 8 feet in height. Certainly I thought they had been artificially planted, and should have gone on in that belief but for the prostrate and still vegetating stem whence they had their origin, and to which (with many others in less advanced stages) they were yet attached.

The production of adventitious buds in *A. comosa* is similarly copious, and more in the natural process of growth; even with a vigorously developing main axis plants are by no means rare in which the exterior bases of the stipes in the older parts of the caudex are studded with shoots and buds in various stages of development. By these means the individual plants frequently attain most bulky proportions; a plant which I measured had an erect caudex 20 feet in height, and presented from 8 feet downwards an elongated cone, with a base 10 feet in circumference, formed by the conjoined adventitious roots

and stems of sixty fairly-developed frond-bearing shoots, varying from 2 inches to 6 feet in length, and from 3 to 13 inches in circumference. *A. gigantea* never (that I have seen) attains these proportions; and there is another noteworthy difference in the development of their respective buds. In *A. gigantea* simply pinnatifid fronds are produced almost contemporaneously with the appearance of the bud as a distinct organ on the stem, or before it is larger than a mustard-seed. On the other hand, in *A. comosa*, from the appearance of the fronds, there is generally a considerable development of the axial parts (*vide* Plate II.), which assume a pyriform shape, enveloped upwards in brown subulate scales, and below in a fascicle of short, slender adventitious roots. Thus ere a single frond has appeared they have a sufficient amount of independent vitality to be separated from the parent stem, and give rise to new individuals, presenting in this respect an analogy to many other proliferous *hill*-plants.

The normal forking of the main axis I have observed in three of the Sikkim species, viz. *Alsophila latebrosa*, *A. ornata*, and *A. gigantea*. In the two latter, however, ramifications occur much less frequently by this process than by the production of adventitious buds, which I have never observed on the first-named species: indeed ramification in any form is rare in the extreme in this species; and of the many specimens which I have seen of it in the Sikkim forests, one only was branched, and that, singularly enough, in a very striking manner, as is partially shown by the representation (Plate I.). This specimen had a clear erect bole 25 feet in height, whence, nearly in a verticil and probably by division of the terminal bud, proceeded seven stout symmetrical branches. I have said by division of the terminal bud, which I consider the more probable origin of these shoots, as all were in unbroken continuity with the main stem, and in this respect differed from those originating as adventitious buds, which, moreover, I believe, as just stated, are never produced by this species. At about six inches above the pseudo-verticil one of the shoots bifurcates, as shown on the plate; and again, at a height of about 2 feet, two others are forked, thus producing a *ten-headed specimen*. The individual shoots are all very perfectly developed, varying in length from 5 to 12 feet, in circumference from 7 to 13 inches, and each surmounted by a corona of intertangling fronds*.

In the sketch of a triple-headed specimen (Plate IX. fig. 3) of *A. ornata* which I found in Sikkim, the origin of the ramifications is very clearly shown. The constriction evident on the main stem, immediately under the divisions, indicates the partial arrest of the terminal bud as a cause for the lateral divergence of the organizing force, though in the majority of instances division occurs without any apparent cause. The structure of the stem in the above case had all the appearance, at first sight, of a normal

* When I first looked on that noble specimen, I thought of it as one that would indeed have been a prize to any botanical museum; and, but that it lay on a road which was then being opened out to the Government Cinchona plantations, and not in the midst of an unfrequented forest, even its uniqueness would not then have spared its addition to the museum. Ill bestowed, however, did my self-denial prove; and great was my chagrin, only a few months latter, to hear from Mr. Gammie that it had been cut down (no doubt out of idle curiosity) by some of the natives in an adjoining bustie, who had seen us measuring and working about the plant. I wrote at once to have a portion of the stem, including the forkings, secured: but the Vandalic cutters had spared not even this remnant; all was hacked and minced.

trifurcation, the dwarfed (and what I was disposed to regard as the original) axial bud occupying an apparently median though somewhat deflected position on the same plane as the other two. The dissections, however, show that this is not the case, but that it is simply the result of a bifurcation repeated on one of the axes, the bifurcation of the terminal bud giving rise to shoots *A* and *B*, the latter undergoing a secondary furcation, and giving rise to *C*, a few lines higher. The points of origin of the different forks thus differing so slightly in the transverse sectional drawing, we find all presenting much the appearance of having had a consentaneous origin. With reference to Hofmeister's mode of distinguishing buds from normal ramifications, the difficulty is here exemplified. In the primary forks we find the shoot *A*, from the more vigorous development of the shoot *B*, laterally displaced and suddenly contracted at the base, presenting very slightly more continuity with the main axis than do many lateral buds, which readily shows the difficulty there must be in cases of more complete suppression (of such terminal shoots) to distinguish them from ordinary lateral buds.

This we will here attempt to exemplify more fully by reference to the very viviparous *A. comosa*, a specimen of which is represented in Plate II. We there find that nearly all the young buds originate around the exterior base of the stipes, and always below the diaphragm of the latter. The stems of these adventitious buds are ultimately continuous with the woody base of the stipes, and, as a matter of course, with the interior woody structure of the stem, as shown in the transverse section of *A. comosa*, Plate II., fig. 4. In structure these are very different from those originating on the other parts of the stem, in which the woody parts are reduced to a slender root-like process, connected with the external woody laminæ of the stem, and always readily distinguishable as adventitious buds. These, I suspect, are the normal adventitious buds of Hofmeister, while the others seem to me to hold an intermediate position between those and the lateral buds of that author. Though it is thus by no means so easy to distinguish the different forms of adventitious buds from bifurcations of the apex, there can be no question, as Hofmeister has rightly insisted, that the ramification of the vascular cryptogams has only an analogical relation to the axillary position of the branches of phænogams. The buds of *Trichomanes*, which Mettenius considered truly axillary, are much too variable to afford any satisfactory conclusion, as are also those of the *Davalliæ*, as admitted by Mettenius.

The Stipal Loculi.—Around the external base of the frond of all tree ferns (*vide* Plate VIII.) we find a series of irregularly shaped perforations, filled, in the mature state, with a brown, glossy, carbonaceous powder. The various appearances they present are shown under the respective species; but it is difficult to conjecture what purpose they serve in the economy of the plant. Though placed directly in the bud-region, they in no case give origin to these; nor do rootlets ever protrude from them. They are found in the earliest stages of the frond's development, and are then filled with a green cellular tissue; and as they are on the same plane as the fleshy parenchyma of the frond, I have been frequently disposed to consider them the aborted tracings, corresponding to the costæ, of a strongly auricled-frond-bearing progenitor. This view seems to me supported by the fact that similar perforations are continued up the sides of the frond,

as is shown in the figures of *A. latebrosa*, which are doubtless abortive pinnæ. Moreover the basal and lateral loculi have primarily the same contents; and indeed the ultimate difference is by no means important—namely, the reduction of the contents of the basal cells into a loose brown sporoidal matter, while the upper or lateral retain their original cellularity, though not unfrequently we find their contents passing gradually into one another. Hugo Mohl ('De Structura Filicum Arborearum,' p. 45, § 12) describes these organs as occurring in several Brazilian species of *Alsophila*, and gives various sections of them in tab. xxxv., but offers no opinion as to their signification in the economy of the plant, further, indeed, than a reference to that of Martius, who had suggested their analogy with the antheridial organs of other cryptogams, prior, of course, to the detection of the true sexual organs by Leszczyc-Suminski. Their analogical resemblance to the imbedded axillary capsules of *Isoetes* and the pulverulent contents anyhow shows that Martius's view was more than a mere unfounded hypothesis (*vide* Schleiden, Princip. Bot. p. 194); and, indeed, there may be still those who, in spite of Schleiden's sneer, may (perhaps not incorrectly) be disposed to regard them as the aborted spore-cases of some ancient progenitor. It is curious that a somewhat correlated organ of dubious import should also occur in Lycopods. Karl Müller was the first to detect this organ, which he describes in his paper "on the Development of the Lycopodiaceæ," in the Bot. Zeitung, July 31st, 1846. This, which he terms an "accessory organ," he finds present in all stages of the plant's existence. In the terminal bud of the germ-plant it is fully developed, and placed between the bud of the branch and the bud-envelope. It is again met with in the axils of both forms of leaves; in the terminal bud it occurs soon after the development of the leaf from the stem, and is always placed between them; it is also found between the oophoridium and the antheridium and their involucral leaves. It is usually of a pyriform shape, consisting of a number of delicate transparent parenchymatous cells filled with a finely granular matter of a reddish colour. With its full development it becomes truncated at the top, and thus continues until the annual growth of the plant is completed, when it withers with the leaves, apparently without acquiring any further development. Karl Müller continues:—"It is difficult with respect to this enigmatical organ to make even an approximation to its real import . . . . Its analogues appear to me to occur in those buds which are often met with in the axils between leaf and stem in various other cryptogams, as, for example, in the axils of the leaves of *Bryum annotinum* and others. Here, however, it must not be forgotten that in our case the cells never have green contents which they have in the loculi of ferns; consequently they cannot be regarded as buds. Are they abortive branches? or are they radicular organs? Reasons may be brought forward in support of both views, yet they seem to me inadequate to solve the question." Without pretending to offer an opinion as to what these really are, I cannot think that they are either aborted buds or radicular organs, as I have found that, in those cases in which the development of the main axis has been arrested, those organs never undergo further development, but distinct cellular papillæ are produced, either at the exterior base of the leaves or in an intermediate position in their cyclar line. And these give origin to the young shoots. I may remark, however,

that the production of adventitious buds in the genus *Lycopodium* is by no means a frequent occurrence; and I have as yet observed it on two species only, *L. nummulariifolium* and a handsome new species akin to *L. Phlegmaria*, which has been lately introduced to the Gardens from Sumatra.

Defoliation.—The fall of the frond is in general gradual; and in Sikkim one only of the species is truly deciduous. This, as I have previously remarked, is the *Alsophila comosa*, which casts its leaves about the beginning of August, and so remains for from four to five weeks, when another cycle of fronds is rapidly unfolded. The fall of the leaf in this plant during August is singular and anomalous. Through all those wide forest-stretches every tree and bush in the height of their rainy season is in verdure, while this tree fern, like some imperfectly acclimatized intruder, stands bare and leafless. The fall of the leaf in this case therefore cannot be attributed to the ordinarily assigned causes, such as change in the season, nor the other less or more potent influence of axillary buds. It is, indeed, difficult to conjecture as to the cause of defoliation in this case. Its congener, *Alsophila latebrosa*, is in full verdure, as are all their more humble congeners. I have carefully examined the base of the fronds of this plant, and compared them with those of other non-deciduous species, without finding any explanatory difference. In all the species we find the parts much as H. Von Mohl described them as having place amongst phænogams. A "separating layer" of cortical tissue, originating in the axillary side of the leaf, extends downwards, and ultimately forms a complete line of demarcation between the stem and distant parts of the leaf. With this process of vegetation, corresponding to the maturity of the frond, all further development of the distant parts of the frond ceases (and we may suppose that it will tend to direct the sap-current into newer and younger channels), the separating layer becomes hard and woody, and forms a clean detaching surface. This "separating layer" appears as a very thin membrane in the earliest stages of development of the frond, and forms a distinct line between the distal and proximal parts of the leaf*. A similar membrane is, I believe, more or less distinctly present in all leaves, forming a line of demarcation between the axial and lateral organs. In many cases, as in nearly all monocotyledons, and generally in all lax-textured petioles, a slight constriction in the nascent leaves is the only indication we find of this organ, which becomes absorbed in the more rapidly developing longitudinal tissues. In dicotyledons, on the other hand, with a more equable development of the tissues, the separating layer is very generally present, increases in thickness with the transverse tension of the leaf, and forms a distinct articulating surface, whence, as they individually reach maturity, they drop from the axis. Such are the phenomena presented in the fall of the leaf of *A. comosa* and a few other ferns, though here, as in endogens generally, the majority undergo decay from above downward to the hardened bases of the stipes, which often retain their attachment to the stem for several years.

* For details on the development of leaves, I can but refer to Eichler's excellent thesis, of which an abstract, with original observations and comments, has been communicated to the Botanical Society, Edinburgh, *vide* Trans. 1865, 1866, by Dr. M'Nab. It is there shown that the incipient leaf is divided into proximal and distal portions, "hypophyll" and "epiphyll" of Dr. M'Nab, the latter giving rise to the lamina, and the former to the stipulary organs when present.

Circination, though not peculiar to ferns, is certainly one of their most striking characteristics. The adaptation of the circinate mode of vernation to the development of the young fronds is very evident when we reflect on their early isolated position on the axis and their acrogenous development—unlike what occurs in Palms and Cycads, both of which are characterized by a straight vernation, though singularly enough we find in all class-books the latter order as "frequently represented by a circinate vernation." This occurs in no Cycad which I have had an opportunity of seeing; certainly not in the genus *Cycas*, which, if I mistake not, is the one referred to by authors. In all the Indian species of this genus I have found a simply involute vernation, the edges only of the pinnæ rolled inwards, and in no case have I observed the rachis rolled spirally downward. This, as in palms, is always straight; the fronds, arranged in large clusters, form a mutual protection to the young unfolding parts, rendering a circinate vernation superfluous and, indeed, impossible. In ferns, as I have said, the arrangement of the parts is altogether different. In these we have a flatly paraboloidal terminal apex, on which the young fronds are almost horizontally arranged. The increase of the number of cells is entirely confined to very short apical radii, beyond which all increase is by a simple cellular expansion; this goes on rapidly, so that the horizontally placed fronds and other parts are, as Hofmeister expresses it, "lifted up by degrees and projected upon a cylinder," the caudex. This causes the isolation of the fronds, and consequently increases their liability to injury, which, however, is admirably guarded against by their circinate habit. This habit, I may further remark, is a very natural result of their progressive isolation. We have first a centrifugal development of cells passing into a similar expansion; this (*i. e.* the development of the axis) decreasing outwards, we might theoretically assume that the longitudinal development of the rachis will go on more rapidly along the lower than the upper planes. This we find to be the case. Thus the first appearance of the fronds is as simple papillæ, near the apex of the axis: and on all the tree ferns which have periodical growths, and simultaneously unfold one or, at the most, two cycles of fronds (the number of which is limited by the spirals in a cycle) annually, the further development of the rudimentary frond in length and thickness is extremely slow, cell-development proceeding, as I have remarked, more rapidly along the lower than the upper planes, an evident curvature is apparent even in the rudimentary stages of the frond's existence. As the frond-development proceeds so do the differences in the development of the two axes become more marked, in the first instance by a more rapid cellular increase, and latterly by simple cellular extension, thus giving the characteristic crozier-like outline, and well securing from all chances of injury the soft and tender apex. It is curious that circination, a comparatively rare mode of vernation, should also especially characterize Sun-dews, (Droseraceæ), and further, as I am disposed to think, serve the same purpose in the economy of these plants—an opinion which I think will be readily admitted on reflecting on the many insects which haunt and are impaled upon these veritable fly-traps, rendering very necessary some such protective agency to the slender developing axis as that afforded by a circinate mode of vernation. Circination in the inflorescence, as in certain of the Borragineæ and others, has, I believe, more relation to the fertilization of

the flowers than any merely protective agency; anyhow this is highly probable from the relations so well explained by Herbert Spencer (*vide* 'Principles of Biology,' chap. x. p. 146, vol. ii.). It is there shown that all radially symmetrical flowers have vertical axes, and that deviations from this symmetry are in all probability adjustments to the fertilizing process. Mr. Herbert, adopting Darwin's views, reasons thus:—"So long as the axis of a flower is vertical and the conditions similar all round, a bee or butterfly alighting in it will be as likely to come from one side as from another; and hence hindrance rather than facilitation would result if the several sides of the flower did not afford it equally free access. In like manner, flowers which are distributed over a plant in such ways that their disks open out on planes of all directions and inclinations will have no tendency to lose their radial symmetry ..... but flowers so fixed as to open out sideways in tolerably constant altitudes have their petals differently related to insect-agency..... A long undermost petal or lip, by enabling the insect to settle in such a way as to bring its head opposite to the opening of the tube, aids its fertilizing agency"(p. 153). Now, in the cases of circination referred to (for example, in *Myosotis*), we find first radial symmetry of the flowers with a second arrangement, so that as the stem unfolds the flower passes from the inverted to the upward position of the mouth, and ultimately, and probably after the fertilization, assumes a lateral position on the axis. Thus, as I believe, circination, though subserving (as in the above cases) distinct ends in the plant's economy, has been acquired through "natural selection," which, "working" (as Mr. Darwin well expresses it in reference to somewhat cognate cases; *vide* 'Origin of Species,' 3d ed. p. 213) "for the good of each being, and taking advantage of analogous variations, has sometimes modified in very nearly the same manner two parts in two organic beings, which beings owe but little of their structure in common to inheritance from the same ancestor."

I will now briefly summarize the peculiarities and affinities of tree ferns, commencing with the development of the embryo plant.

1. The first product of the spore is the prothallium, with its antheridial and archegonial cells, which by a fertilizing process give origin to an embryonic body, whence proceed the fronds and caudex.

2. In the earliest stages of the caudex transverse sections exhibit only one vascular bundle. The point of origin of this in the stem is predetermined by the first frond, whence the longitudinal axis of the nascent fibro-vascular bundle is directed. This fibro-vascular bundle grows upwards and outwards into the first frond, with which it is subsequently simultaneously developed; again, from the lower end of the bundle a branchlet passes out into the first root. With the development of the primary frond and root there is a simultaneous and somewhat rapid apical growth of the young stem, and a continuation of the primary vascular bundle to the point of origin of the second frond. A similar development of the stem and vascular bundle is continued until the appearance of the sixth or even the ninth frond. In all the Sikkim species of which I have had an opportunity to examine young plants, the frond-arrangement is thus far tristichous, and the angular divergence, of course, one third. The stem is now very perceptibly increasing in thickness, and depressed or flattened at the apex; the angular

divergence of the fronds gradually passes into the pentastichous; and the until now solitary vascular bundle gives off branches to each frond. These run up the stem in a wavy manner, anastomose laterally at the points of origin of the fronds, and form a peripherical network, similar in all respects to the arrangement of the fibro-vascular system in the fasciculate herbaceous species.

3. The pentastichous arrangement of the frond is in general adhered to until the stem has attained some five or six inches in height and from three fourths to one inch in diameter. By the time the stem attains the above height the vascular system, which previously consisted of slender cylindrical bundles, is now much more developed, forming narrow laminæ, and thus reducing much the diameter of the interspersed meshes. The diameter of the stem undergoes a rapid increase; the angular divergence of the fronds is reduced; and their five-ranked arrangement gives place to a more complex one. The development of the stem thus proceeds; and on its attaining the height of from ten inches to one foot, we find that the softer and more cellular-stemmed species (*e. g. A. comosa, A. contaminans*) have nearly attained the full diameter of stem, and the fronds their normal arrangement—a condition which is in general attained at a much later stage in such species as *A. latebrosa*, *A. glabra*, and others characterized by an increased development of the fibro-vascular system.

4. Longitudinal sections of the stem now present the following appearance; and for illustrative purposes I select *A. glabra* as presenting the greatest development of the fibro-vascular system, and consequently the most complex conditions. In this species we have a most complicated anastomosing of the woody bundles, which, originating at base of the stipes, pass downwards into the interior of the stem, and either curve outward and coalesce with the inner of the peripherical woody laminæ, or remain with their lower extremity free in the inner and cellular parts of the stem. Enclosing these are the woody laminæ, consisting first of two blackish-brown exterior laminæ, followed by two thicker pale straw-coloured strata of irregular parenchyma, surrounding a central stratum of soft pale-brown trachenchyma, mixed with thin-sided parenchymatous tissue.

5. The development of the free woody bundles proceeds from the centre, or point of origin at the base of the frond, by both extremities, the lower growing downwards in the stem, the upper passing out into the superposed frond. The downward growth of the woody bundles is apparently limited by the maturity of the frond in which their upper extremities ascend. The downward growth is also very much slower than the upward; thus the frond's ascending apex, for example, in *A. latebrosa* attains a length of from 8–11 feet, while the descending extremity in the stem varies in general from 10–18 inches, and in one case only have I found it attain 2 feet.

6. The other woody bundles of the stipes are given off by the woody laminæ of the stem, and form a peripherical layer in the stipe. These pass from the main laminæ below the diaphragm of the stipe as isolated bundles; and though undergoing occasional bifurcations in the stipes, I have in no instance detected any of them coalescing, as so frequently occurs with their lower extremities in the caudex.

7. The continued descent of free woody bundles in the caudices of those species so

characterized, and the consequent compression of the surrounding cellular tissue, render it denser and harder, so that the lower parts are always much harder and more woody than the upper. Mechanical strains are also potent agents in the increase of the dense deposits; and we have further, in the general distribution of the woody system, a peripheral woody casing surrounding a cellular core, the simplest though not the least effective mode of resisting such tensions.

8. In transverse sections the woody framework appears in from three to five detached peripheral laminæ, the difference in number being due to variations in the frond-arrangement of the different species. The interspaces indicate the position of the fronds, and vary in width, according as they are more or less near the axis of the latter, as explained by their lozenge-shaped appearance in the longitudinal sections. In fresh sections the woody laminæ usually present concavo-convex surfaces, less commonly irregular wavy outlines; in sections of dried specimens, on the other hand, the laminæ present various curvatures, according to the less or more regular drying of the stem. In this process the laminæ are frequently broken; so that there are frequently more of them than normally characterize the species.

9. The transverse sections of the apex of the stem have a somewhat complex arrangement, representing the nascent woody system, and indicating the points of origin of several successive cycles of fronds. The points of origin of the fronds are thus organically predetermined by the vascular system; and their distribution can have nothing whatever to do with the distribution of this, and of course infinitely less in its compaction. The idea of the caudex as a product of the coalescent bases of the fronds is wholly unfounded.

10. The caudex of ferns retains its solidity to the last, and has, as above explained, a tendency to increase in density and hardness. It is a mistaken notion of authors to represent the stem as frequently hollow at the base by the rupture of the central cellular axis. This view could only have been founded on the examination of dried caudices, in which, as a matter of course, we find the cellular parts irregularly ruptured or, indeed, wholly absent. Such results do not occur in the living plant, or at least could there only be the result of physical injury or the destructive inroads of the boring beetles.

11. The distribution of the vascular system in the caudices of the dwarf herbaceous species differs only in the degree of development from that of the arborescent species. Longitudinal sections exhibit no continuous strata; all are short and detached, and wanting in the regularity of distribution of the arborescent kinds, though the general woody filaments, as in young individuals of the latter, form a peripherical network with more or less regular lozenge-shaped meshes. The fibro-vascular bundles of the fronds are given off along the sides of the meshes, and pass into the stipes in a laminar form, in this respect differing from the arborescent species, as also in the entire absence of the free woody bundles. In those species where one bundle only passes into the stipe, it is given off at the upper angle of the mesh. The distribution of the fibro-vascular system is very clearly shown to be in no way causally effected by the disposition of the fronds by an examination of the tubers of *Nephrolepis tuberosa*, in which we find radiating from the solitary vascular bundles of the stolon a number of thin wiry fibres variously anasto-

mosing, and forming a polygonal network concentric with the cellular knob. Again, in no respect do the elongated frondless ends of the shoots of such species as *Acrostichum* (*Stenosemia*) *scandens*, *Polypodium* (*Phegopteris*) *punctatum*, and other widely creeping species, differ from the frond-bearing parts.

12. Adventitious roots originate indifferently on the cortical region and the interior woody laminæ. Those originating in the former region are most abundantly produced in certain species (*Alsophila latebrosa* and *A. contaminans*), and give quite a shagreen-like covering to the stem in their younger stages. It is only in the moistest forest tracts where these undergo any considerable degree of development; and that strong thick matting which so frequently surrounds the caudex (exceeding by many times the diameter of the latter) is chiefly composed of those roots which spring from the interior laminæ. The points of origin of the adventitious roots are by no means fixed, appearing in all the interfrondal spaces of the caudex. In no case, however, are they continuations of the free woody bundles, nor do they partake of their anastomosing character, though greatly exceeding them in their tendency to ramify.

13. The diaphragm or "separating layer," between the proximal and distal parts of the frond, occurring (as I stated above) in both deciduous and nondeciduous species, can scarcely, in my opinion, be regarded as a truly causal agent in the phenomena of defoliation. Von Mohl and Eichler, who have studied the subject, and were the first to detect the "separating layer," afford but slight grounds for the supposition of its causal relations to the fall of the leaf; nor do they afford us any sort of explanation as to how this secondary growth may have been initiated. With regard to the first point, while admitting certain incidental relations which might have justified the adoption of the views of Von Mohl in the absence of any positive evidence of a negative character, we have the occurrence of the "separating layer" somewhat indifferently in deciduous and non-deciduous species, as, for example, in the tree ferns noted above; then there is the regulated specific periodicity of the fall of the leaf, which we must take into consideration as probably related to those physico-vital processes less or more active in all vegetable development. The fall of the leaf occurs, as we all know, at definitely recurring periods, varying somewhat in individuals, just as in floral periodicity, from an inherited peculiarity, originating in a correlation of conditions less or more favourable to the development of their progenitors. It has been stated that deciduous trees grown in the tropics become evergreen—the Cherry for example. Of this I know nothing from personal observation; but if like the Vine, the Pear, and the Apple, which live and vegetate in the plains of Bengal, this is only partly correct. These trees are rarely utterly leafless; nevertheless they have, as in their indigenous habitats, stated periods of vernation and defoliation, with this difference, that a constant verdure is sustained by the continued evolution of young shoots and leaves. The older leaves are shed with considerable regularity twice a year, first at the close of the cold season and the ushering in of the hot, and again between the termination of the rainy and the commencement of the cold season. In view of the foregoing evidence, I am thus disposed to believe that we must yet continue to regard these phenomena as the result of a tem-

porary cessation of the vegetative forces, brought about by the vicissitudes of climate, or at least specific periodicities of rest and action in the vegetable economy.

I may now briefly remark on the probable causes which may initiate the secondary growth or "separating layer" of the leaf. This I am disposed to attribute to mechanical strains and an acquired habit of disarticulating at certain periods. In support of this view I may note its occurrence at the point where the strain must evidently be greatest, near the junction of the leaf with the stem, or where the flexibility of the petiole is lost in the comparatively inflexible stem; and in accordance with this or the greater downward strain of the generality of leaves, we find the separating layer originating in the axillary side of the leaf, thence growing downwards at right angles to the plane of the leaf: possibly an examination of phyllodia might show a simultaneous growth from either side. The commencement of the above organ is early apparent in the constriction of the petiole adjoining the "pulvinus." Several illustrations of a disforming character might, as I am aware, be adduced; but it is to be remarked that many such are only apparently so, and depend on more or less evident modifying agents, as, for example, the loose thickened tissue and great sheathing petioles of many monocotyledons, which, equalizing the strain, leave no traces of constriction or "separating layers."

14. Circination, protective in the unfolding leaves, assists in the economy of fertilization when characterizing the inflorescence, and in both cases is the result of an unequal development of the cells on opposite sides of the rachis.

15. The *lacunæ* at the base of the fronds of tree ferns have been compared by Lindley to the perforations in the rhizome of *Nymphæa*; but these, as shown by Trecul, and as I, from personal observations, can confirm, are simply the base of decaying adventitious roots. Martius, guided by analogy, suggested their affinity with the antheridial organs of other Cryptogams. The subsequent discovery of the antheridial organs has displaced this view, though their analogy with those of *Isoetes* and *Lycopodium* renders it by no means improbable that they may really be abortive representatives of those organs. They have also relations to those accessory organs described by Karl Mueller as occurring in the axils of the leaves of Lycopods, though here, again, we are alike in utter ignorance, as admitted by Mueller, of the import of these organs. After a full consideration of the above views, I am rather disposed, as I have above stated, to regard them as the aborted costæ of a sessile strongly auricled frond, in which view I am supported by a line of very similar perforations on the lower parts of the rachis, in the plane of the primary divisions of the frond, of which parts they are clearly abortions.

16. The scars of the frond in the fully developed caudex are arranged with great regularity, and, from their varying angular divergence in closely allied species, afford good discriminating characters.

17. The prolificness and bifurcation of the caudex occurs frequently in several species, though we rarely find both characters strongly pronounced in a single species. In proliferous species the buds are most frequently on the exterior base of the stipes, also in various extra-axillary and lateral positions; but in no case have I observed them truly axillary. Adventitious buds are in certain cases with difficulty, as I have above explained, distinguishable from normal bifurcations of the axis. This is especially the case

in those buds which, originating on the base of the stipes, have a direct connexion with the interior parts of the stem by the meshes of the fronds, as compared with the frequently occurring early arrested ramification of the stem. The buds of tree ferns are all truly adventitious, and distinct from the axillary buds of phænogams; and in no case have I observed them on the surface of the frond, as in many of the dwarf herbaceous species. Ramifications of the main axis are produced either by suppression of the growing point and the development of lateral shoots, or by simple or more or less compound bifurcations. Illustrations of these have been given. The prolificness and axial ramifications of the dwarfer species of ferns are in no respect different from those of the arborescent species.

18. *Concluding remarks on the anatomical relations of the Caudex.*—The arborescent ferns present somewhat complicated affinities, and, it must be admitted, no very close relations beyond their own alliance, which may be largely due to their ancient origin. So far as known, they appeared first in the Devonian period, were largely represented, and apparently formed one of the most striking features of the succeeding Carboniferous flora, whence they have persisted, without any marked change, to diversify and enrich all subsequent floras. The tree ferns at the present day, as in their most ancient representatives, are characterized by a soft cellular central part, surrounded by a woody cylinder, which is again enveloped in a hardened cortex, exteriorly marked by large elliptical or rhomboidal scars, left by the fall of the fronds, and also (as in the Psaronites of the Permian period) by a dense mass of adventitious roots much exceeding in thickness the caudex. The frond-arrangement also, as indicated by the scars, is similar in ancient and modern species. Thus in the majority of the latter the arrangement is quincuncial, as was the case in *Caulopteris primæva* and others of the Carboniferous epoch; or, again, as in *Alsophila glabra*, the scars are in continuous lines parallel to the longitudinal axis of the caudex, as was likewise the arrangement in the ancient *Ptychopteris macrodiscus*. In those epochs there was no lack of related forms, as the gigantic *Lepidodendron*, *Calamites*, and *Sigillaria*, of which the latter connects them very closely with Cycads; but these have long ago had their periods of waning and extinction; and we now find the ancient arborescent form of ferns differing much in mould and structure from all its living compeers.

The relations, as founded on the structure of the stem, when we pass beyond their own alliances, are perhaps, upon the whole, closest with Palms, though they also seem to have much in common with Nymphæas, whence they pass to Cacti, the succulent Euphorbiaceæ, Asclepiads, and other dicotyledonous plants with undeveloped internodes. First, then, they agree with Palms in their mode of growth, and in the manner in which the leaves are arranged. I fail to see why the growth of the one should be termed endogenous, and the other acrogenous. If the peculiarity of endogeneity is the downward growth of a series of vascular bundles from the leaves in a curvilinear mode, from the interior to the periphery, not a few of the tree ferns have very similar characteristics. In both, diametrically and longitudinally, growth is strictly apical; in both the stems are limited in their diametrical growth, and from the first traces of their formation the axial and peripheral developments are simultaneous, and as soon as the

normal thickness has been attained, all further peripheral increase ceases, and the axis grows upward in a cylindrical form. In Palms the growing point is conical, and in tree ferns terminally flattened; so that in the one case the nascent vascular bundles are almost horizontally arranged on the apex, in the other they are, from the beginning, vertical; but in both all cellular increase of the body of the axis has ceased ere the fronds have attained their full development. Another point in which they agree, is in the development of a system of free vascular bundles, which, originating in the apex of the stem, grow upwards into the fronds and downwards in the axis. In other respects they present many important points of difference, as in the free anastomoses of the fibro-vascular bundles, and the formation of a woody circle surrounding the central cellular axis, which, however, is partially represented in certain Palms (*vide* Plate XII.), as *Euterpe oleracea*, by a dense zone of vascular bundles, which very distinctly separates the central, in which cellular tissue predominates, from the peripherical and essentially vascular. The tissues of this median zone are developed, I believe, exclusively from below upwards, the growing points surrounding the apex of the stem, and passing outwards into the fronds. Dense though this zone is, the bundles do not, in any case that I have observed, inosculate with each other. Another important difference is presented in the passage of these bundles to the fronds. In Ferns small ramifications of the bundles only pass into any given frond, while in Palms the entire bundle enters the frond. I need scarcely remark that there are also important differences in the minute structure of woody bundles of Ferns and Palms, the former being much more simple, though apparently similarly limited in their period of growth. In thus noting the structural affinities and differences of the stems of tree ferns and palms, I by no means ascribe to them an equal grade of organization; tree ferns are decidedly inferior in rank. They have, however, sufficient in common to justify the opinion of their being differently diverged and progressed forms of a common ancestor, which must have been of great antiquity, considering that both apparently presented much the same characteristics in the Carboniferous epoch as they do now.

The anatomical relations of the caudex of tree ferns to the less perfectly developed dicotyledonous stem is of much interest in theoretical natural science, as showing us the graduated steps by which the simpler condition of the fibro-vascular system and stem-structure of the arborescent Filices is related (and that mayhap ancestorially) to that of the more highly developed dicotyledon. The vascular system has been well distinguished by Schleiden as "simultaneous," "definite," and "indefinite." The first two modes of developement are almost peculiar to the higher cryptogams and monocotyledous, though the first is the more especial characteristic of the former, as the second is of the latter class, while the *indefinite* mode characterizes nearly the whole of the dicotyledonons division. In the present remarks it is necessary to notice those only of the latter series presenting the least-perfect forms. This, I believe, is represented by the Nymphæas, which present the following anomalous arrangement—a central parenchymatous mass, interspersed with variously directed isolated woody bundles, with an irregular circle of larger bundles surrounding it. From the latter branches proceed through the external parenchymatous mass towards the appendicular organs, and present a very

complicated arrangement. The vascular system is destitute of the cambium layers, and apparently simultaneously developed with the apex of the stem, inasmuch as (from examination of longitudinal sections) we find it as largely developed towards the apex (though naturally less hardened) as in the lower and older parts. Cell-development seems to me confined to the flattened apex, all further peripherical increase being due to cell-expansion, as shown by the enlarged size of the latter as compared with the former. Waving, then, the difference in the anatomy of the bundles and the other structural and morphological characteristics of Nymphæas and Ferns, we have evidently a considerable analogy in the growth and development of the main axis, in the apparently simultaneous development of the vascular bundles, with an absence of the cambium layer, and in the origin of the adventitious roots from the base (generally) of the rootstalks of the leaves —all characters common to both forms. The affinity of the nymphæaceous stem with the monocotyledonous has been urged by various authors; and there can be no doubt they have many characters in common; indeed, if we have regard to stem-structure only, the characters, aberrant though they be, are more strongly mono- than dicotyledonous. Here, however, we must be guided by the embryo, which, as shown by the authors of the 'Flora Indica,' p. 235, is truly dicotyledonous. Slight stress can be laid on Trecul's objection that the cotyledons are retained within the seed, which seems to me but a natural adaptation to the conditions under which germination usually takes place. The slightest reflection on the function of these organs, and the fact that the seeds often germinate under many feet of water, teaches us how, by the "survival of the fittest," the ordinary mode of development may have been departed from by arresting the cotyledonary development, economizing the then feeble vegetative forces for the development of the plumule and the projection of the primary leaf to the surface of the waters. The degradation, so to speak, in the structure of the stem, is also a very probable result of the conditions of growth; the comparative absence of mechanical strain on the leaves of these plants indicates, in my opinion, how the development of the woody system may have been gradually reduced, generation after generation, until it reached its present aberrant condition. Reflecting, then, on the fact that mechanical action is a most potent agent in the building-up of the woody structure, it is of high interest to trace such retrogressions as the above under its reduced action. The interest in the present case is much increased by the high systematic position of the order, and the comparatively great anatomical degradation they have undergone. Again, if, under these conditions, the anatomy of *Nymphæa* has thus retrograded and presented so many characters in common with tree ferns, may we not justifiably assume that the conditions in which tree ferns most abound (in shady sheltered valleys, amidst dense forests and the most placid environments) have been equally potent in giving to them their anatomical characters, which differ only in degree from those of their humbler congeners, and which they have so unchangedly retained in the general progression through many long geological periods.

Schleiden remarks that "the whole structure of certain Cactaceæ bears great similarity to that of the arborescent ferns, allowing for the different nature of the vascular bundles and the difference of dimension." And, again, he elsewhere remarks, "I believe it would

not be difficult to prove that all the modifications of woody tissue in ferns occur in every essential point in the Cactaceæ and the succulent Euphorbiaceæ." With reference to this I have to remark that the arrangement of the vascular bundles in the first stages differs but little from that characteristic of the young shoots of dicotyledonous plants in general, and that ultimately they seem to me to find their closest relationship, structurally and physiologically, in Cycads, more remotely with Nymphæas. They (the Cacti) have thus but a very indirect connexion with the Ferns; and I should not have noticed them here but for Schleiden's remarks, from which I may assign the following reasons for differing :—

In Cacti, the composition of the stem is :—1st, a central parenchymatous mass; 2nd, a zone of vascular bundles separated concentrically, and also in a partial manner radially, by thin cellular layers; and, 3rd, a largely developed cortical parenchyma. In Cycads the general arrangement is much the same, the difference being more in degree than kind; thus, the concentric zones have thicker layers of cellular matter interposed, and the intrusion of the cortical parenchyma in vertical planes is very much more marked, giving to the wood a peculiar tendency to split up, when dry, into thin radial laminæ. Such, then, are a few of the more prominent structural relations of Cycads and Cacti, to which I may add the following physiological ones. It is well known that Cacti are singularly tenacious of life; but it is not so generally known that Cycads possess the same quality in an equally high degree. An uprooted Cycas, even in ordinary forest shade, will produce adventitious roots and an abundance of adventitious buds from all parts of its stem; so also with Cacti, though with much less facility when the stem is otherwise uninjured. Again, when the stems of a Cycas are broken off, the surface is readily closed over by a development of the cortical and intravascular parenchyma, whence adventitious buds sooner or later proceed. In Cacti the intravascular parenchyma is less active than the cortical; and we find that under similar conditions to those noted in *Cycas* a thick surrounding "callus" is developed from the cortex, while a few cellular papillæ, "embryo buds," are the products of the intravascular cellular layers. In all the above characters therefore there is a considerable similarity between *Cycas* and Cacti. There is thus evidently a wide gap between the anatomy of the stems of Cacti and tree ferns, between which, if I mistake not, Nymphæas may be very naturally interposed, as combining a living type of exogenous flower structure with an acrogenous development of the stem.

With regard to habit and arrangement of the reproductive organs, the tree ferns, as has been frequently remarked, have considerable affinity to Cycads; but from my observations their further relationship by a circinate vernation is unfounded. I have been particularly observant on this point, and write from repeated examination of plants in their own habitats as well as those in the Botanic Gardens, Calcutta; and in no case have I seen circinate fronds on a Cycad. While I now write I have before me the young unfolding fronds of the following species :—*Cycas circinalis*, Linn., *C. Rumphii*, Miq., *C. revolula*, Thunb., *C. siamensis*, Miq., all of which have a straight vernation, with involute pinnæ; and this, I suspect, has been the origin of the opposite view now so generally adopted by authors, apparently on the authority of Linnæus and Roxburgh's

C. circinalis, and Thunberg's *C. revoluta*, both of which are singularly inapplicable. Indeed the close imbrication of the fronds in the bud of Cycads renders all but impossible a gyrate vernation, which, for my part, I should have as soon looked for in the choicest of a florist's roses or camellias. The vernation and other characters of a few Cycads are shown in Plate XII.

The Ophioglossaceæ have more characters in common with *Cycas* than the Polypodiaceæ, *e. g.* the straight vernation, the distribution of the sporangia on the margins of a spicate branch, as in *Ophioglossum*, or in glomerate tufts, as in *Helminthostachys*. In the latter and perhaps most highly organized genus of the Ophioglossaceæ, we have the nearest approach to *Cycas* in the stem-structure. This stem consists of a central column of parenchyma, surrounded by compact vascular laminæ, a thin layer of elongated thin-sided cambioid tissue, merging into the main parenchymatous mass, which is again enveloped in a thin rind, and thus much resembling the developing apex or young frondless shoots of *Cycas*, with this difference, that while the incipient fronds are successively enveloped by the sheathing bases of their cyclical predecessors, as in Palms, those of Cycads have an independent origin. ..... Such are some of the points of approximation between Adder's-tongues and *Cycas*, *i. e.* before the latter have assumed their higher and characteristic structure. These relations, however, are of much theoretic interest as showing retrogressively a converging tendency from the higher to the lower grades of structure.

In concluding this part of my communication, I have very great pleasure in acknowledging my deep indebtedness to Dr. T. Anderson, Superintendent of the Botanic Gardens here, who has ever been as ready to afford me the necessary facilities for the examination of the tree ferns of Sikkim in their native forests, and also for kindly placing in my hands his own collections.

Description of the Species.

Cyathea, Sm.

Sori on a vein, or in the axil of the forking of a vein. *Receptacle* elevated, globose or elongated. *Involucre* globose, inferior, covering the whole sorus, afterwards breaking at the summit, and forming a more or less persistent cup, even or irregular at the margin.—Arborescent, tropical or subtropical. Stipes often aculeated. Fronds simple or pinnate, or decompoundly pinnate. (Syn. Fil. p. 16.)

1. C. spinulosa, Wall. *Stipes* and *main rachis* strongly aculeated, often dark purple; fronds glabrous, ample, subflaccid; *pinnules* oblong, acuminate; *lobes* acute, serrulate, with small bullate *scales* on the costules beneath; *sori* copious, close to the costules; *involucre* globose, very thin, membranous, fragile, soon breaking irregularly. (Syn. Fil. p. 23; Wall. Cat. n. 178; Wall. in herb. 1823; Hook. Sp. Fil. vi. p. 25; Moore's Ind. Fil. p. 273; Bedd. Fil. p. 19, t. 57.) "Pauhyūm" and "pŭgzhōck" of the Lepchas.

This is one of the rarest of the Sikkim tree ferns, probably owing to its being one of the sorts eaten by the Lepchas, indigenous to their own tropical valleys, and

so got with much less difficulty than their own favourite the *A. comosa* ("păshīn") of the higher altitudes. *C. spinulosa* is known to the Lepchas under the names of "pănhjūm" and "pŭgzhōck"—the former name being applied to a somewhat dwarfed form, with caudex rarely exceeding 6 feet in height, found in the drier valleys of the Teesta, the latter to the fully developed form, 30–40 feet high, of the valleys of the Rungbee and the Rungjo, up to an elevation of 2000 feet. The specimens from the valley of the Teesta were brought to me by our Lepcha collectors; but I have myself seen a few specimens of it in the valleys of the Rungbee and the Rungjo. When seen from a little distance, it might be mistaken for *Hemitelia decipiens*, n. sp., though readily distinguishable by its much more flaccid membranous texture and the differently formed involucres. The caudices below are always enveloped in a dense matted mass of strong adventitious roots, and upwards with the strongly armed bases of the persistent stipes, terminating in a handsome corona of pale green fronds. These are from 5 to 8 feet long by 14–24 inches in diameter.

Hemitelia, Br.

Sori globose, dorsal upon a vein or veinlet. *Receptacle* elevated. *Involucre* a scale situated on the underside of the sorus, varying in size and shape and texture, often indistinct, and often very deciduous.—Mostly tropical and arborescent, with the habit of *Cyathea*, a connecting link, as it were, between the latter genus and *Alsophila*, consequently often difficult to recognize. (Syn. Fil. p. 27.)

Hemitelia decipiens, n. sp. Arborescent; caudex occasionally dichotomous, 30–40 or more feet high, covered upwards with the persistent bases of the past year's fronds, and downwards with a mass of adventitious roots; *stipes* of a mahogany-brown colour, strongly aculeate at the base, paleaceous, muricated, furfuraceous, and of a pale brown colour upwards; *fronds* 10–12 feet long, somewhat rigidly coriaceous, glabrous, with a few small fringed bullate scales on the costules, drying of a blackish green above, greyish green below; *primary pinna* 20–30 inches long, 9–12 inches wide, oblong-lanceolate, acuminate; *pinnules* 4–8 inches long, and 10–12 lines broad, pinnatipartite; *segments* linear-oblong, acute, falcate, sèrrate; veins once to thrice forked, or pinnate, with 3–5 veinlets; sori conspicuous, copious, close to the costule, and below or upon the axil of the lowest fork, usually on more or less contracted segments with recurved margins; *involucres* deciduous, varying in size from a small scale at the base of the sorus to large, semicalyciform, 2-lobed or irregularly broken; *paraphyses* small, filiform.—*Alsophila decipiens*, Bedd. Fil. Brit. Ind. t. 311.

Hab. Sikkim, near the junction of the Rungbee and the Rungjo, at 2000 feet elevation, and in the Poomong Cinchona plantation at 2500 feet.

This is the "pŭgzbēek-nōk" of the Lepchas. In my notes which I attached to the specimens of this when collecting I had referred it to *Hemitelia*; but in subsequent examinations of dried specimens, too mature when gathered, which showed but slight traces of an involucre, I doubtfully placed it amongst the *Alsophilæ*, near *A. late-*

brosa. It has been published by Beddome (*vide* 'Ferns of British India,' t. 311) as an *Alsophila*. Lately, however, I have had young specimens, which show it to be a true *Hemitelia*. It is perhaps most closely allied to, though I believe truly distinct from, the more strongly muricated forms of *H. Walkeræ*, especially those with the more elongated falcate segments. Under *Cyathea spinulosa* I have noted its resemblance to that species; it also considerably resembles certain of the more strongly armed peninsular states of *A. contaminans*. Aside from generic characters, however, they are easily distinguished by the opener sinuses and less strictly dichotomous venation of *H. decipiens*, and the glaucous hue of the underside of the fronds of *A. contaminans*. They also differ much in the structure of the stem, the interior of the stem of *H. decipiens* being abundantly interspersed with free woody bundles, which are nearly absent in *A. contaminans*. The fronds are also heptastichously arranged in a $\frac{3}{7}$ angular divergence in the former species, with long persistent bases; in the latter the angular divergence is $\frac{2}{5}$, the stipe altogether less woody, rapidly decaying down to the stem, and leaving upon it, as in the truly articulated species, prominent ovate scars, 4 inches long by 2 inches wide. I may here note that the origin of the Lepcha name, "pagzbeek-nok," or the black pagzbeek, is from its resembling, in armature and development of the fibro-vascular system, *A. latebrosa*, their "pŭgzbēek;" the adjective has its origin in the darker-hued stipes.

Alsophila, Br.

Sori globose, dorsal on a vein or in the forking of a vein. *Receptacle* mostly elevated, frequently villous. *Involucre* absent. Arborescent, chiefly tropical, ferns, with the general habit of *Cyathea* and *Hemitelia*. (Syn. Fil. p. 31.)

1. A. latebrosa, Hk. *Stipes* aculeate at the base, muricated upwards, dark mahogany-brown in colour; *primary pinnæ* oblong-acuminate, 12–24 inches long, 6–8 inches broad; *pinnules* lanceolate-acuminate, 3–4 inches long, ½ an inch broad, and cut down nearly to the rachis into numerous, linear-oblong, blunt, slightly toothed lobes on each side; *texture* herbaceous, upper surface dark green, naked, lower surface naked, or slightly hairy and scaly; *veins* all once forked; *sori* elevated, conspicuous, occupying often the lower two thirds of the segment *.— Hook. & Baker, Syn. Fil. p. 43; Moore, Ind. Fil. p. 52; Bedd. Fil. S. Ind. p. 19, t. 58; *Polypodium latebrosum*, Wall. Cat. n. 318. "Pŭgzbēek" of the Lepchas, by many of whom it is called "Sŭrūngŏ-pălūh," or temperate pălūh.

Hab. An exceedingly abundant species in the Sikkim forests, and having an altitudinal range of from

* Several of the Sikkim plants which I have examined have what appears to me a truly Hemitelioid involucre (quite different in texture from the bullate scales of the rachis and costa), which might almost justify their reference to that genus, but for the absence of any other discriminating characters to distinguish them from the truly non-indusiate individuals with which they are associated, and to which they pass, even in the involucral characters, so that it would be impossible to determine to which of the two some specimens should be referred. Var. β. *Schmidtiana*, Kze. (Linn. xxiv. p. 294), differs from the above forms in the oblong-lanceolate submembranaceous pinnæ, 18–24 inches long by 4–6 inches wide, reduced pinnules, and less elevated receptacles.

3000–6000 feet on the mountain Sinchal. It is, however, most common at elevations of 5500 feet; and at the lower and higher elevations noted above it is but sparingly distributed.

The extreme forms when seen growing are so very dissimilar in general appearance that, but for the many intermediate forms, they might be regarded as specifically distinct. It is the first of the tree ferns which greets the eye in the ascent of these hills by the Ganges and Darjeeling road, as at Kursiong, where there are several fine groves and many isolated plants. These, however, rarely exceed 20 feet in height; and it is only at elevations of 5000 feet and upwards that we find them with fully developed, simple, rarely forked caudices, 30–50 feet high. In one specimen which Mr. Gammie was good enough to measure for me on Sinchal, at an elevation of 5200 feet, the caudex was 43 feet high and 7 feet in circumference near the base. I presume, however, that the girth-measurement was taken round the large cone of adventitious roots, as the thickest specimen which I have seen measured only $4\frac{1}{2}$ feet round the clean caudex.

2. A. CONTAMINANS, Wall. *Stipes* and *rachides* paleaceous at the base, purplish brown, glossy, aculeate, with short prickles tipped with a gland: *fronds* ample, coriaceous, glabrous, black-green above (when dry), glaucous beneath; *primary pinnæ* 2 feet and more long, oblong-ovate, acuminate; *pinnules* sessile, 4–5 inches long, $\frac{1}{2}$ to nearly 1 inch wide, deeply (nearly to the costule) pinnatifid, linear-oblong, subfalcate, entire, the fertile ones often more contracted, with margins (when dry) revolute, obscurely crenate; *veins* once or twice forked; *sori* nearer the costule than the margin, a minute shallow-lobed and cut membrane surrounding the base of the receptacle after the capsules are fallen.—Syn. Fil. p. 41; *A. contaminans*, Wall. Cat. in Index; Bedd. Fil. Brit. Ind. t. 85; *Polypodium contaminans*, Wall. in herb. 1823; Cat. n. 320. "Pălūh-dōōn" of the Lepchas.

Var. β (*A. Brunoniana*, Wall. Cat. n. 7073 B.) unarmed, stipes densely pulverulent; segments more elongated, 5–7 inches long, $\frac{3}{4}$–1 inch wide, obtuse; sori extending nearly to the apex of the segments.—*A. glaucescens*, Wall. n. 7074; *A. Wallichiana*, Prĕsl, Tent. Pterid. p. 62. "Pălūh" of the Lepchas.

The normal form of this species is a rare plant in Sikkim, becoming more abundant in the Khasia hills, and frequent in the Malayan peninsula and islands of the archipelago. The var. β, on the other hand, is one of the commonest of the tropical tree ferns of Sikkim, equally abundant also in the Khasia and adjoining hill-ranges, extending to Burmah, the Malayan peninsula and islands. In Sikkim its altitudinal range is from about 2000–3000 feet: var. α rarely exceeds 25 or 30 feet in height, and from 3–4 feet in circumference: var. β is altogether more graceful, with a tall and slender stem, from 30–50 feet high, and 1–3 feet in circumference, conspicuously and regularly marked with the large scars of the fallen fronds. The base of the stipes and young unfolding fronds are in both densely clothed with long glossy chestnut-coloured scales, and throughout covered (more densely in var. β) with a yellowish grey puberulous matter. The fronds are from 10–18 feet long and 4–8 feet wide. The

glaucous hue of the fronds beneath will distinguish it (*A. contaminans*, var. *Brunoniana*) from *Hemitelia Walkeræ*, with which it has a very considerable resemblance in habit, structure of stipe and rachis, form and texture of pinnæ. This is specially the case when those forms of *H. Walkeræ* with imperfectly developed involucres (scarcely costules) and elongated slightly falcate segments are compared with the *less-fertile* specimens of *A. contaminans*, var. *Brunoniana*.

I was at first disposed to regard var. β as a good and distinct species, as it is always readily distinguishable from var. α in Sikkim by its non-aculeate stipes. An examination, however, of an extensive suite of specimens from the hill-ranges of Eastern Bengal, Burmah, and the Malayan peninsula, clearly shows that they are but forms of one species. The var. β is, I think, without doubt the *A. Brunoniana*, Wall., as there seems to be no other species at all approaching the description of the Sp. Fil. in the Sylhet mountains.

3. A. ORNATA, n. sp. *Arborescent*; *stipes* paleaceous at the base, slightly muricated, and, as well as the main rachises, of a glossy purplish brown colour; *fronds* bi-tripinnate, 7–9 feet long, 3–4 feet wide, herbaceo-membranaceous, upper surface glabrous, brownish green when dry, lower pale green, sparingly scaly on the rachis and costæ; *primary pinnæ* oblongo-lanceolate, rather abruptly contracted into a short deeply pinnatifid apex; *costa* and *costules* slightly scaly below, glabrous above; *pinnules* 3–5 inches long, 6–8 lines broad, sessile, or with one or more of the basal segments petiolate, and more or less lobato-serrate; *segments* oblong, or linear-oblong when fertile, slightly falcate, obtuse, crenato-serrate; *veins* variable, simple to thrice, usually once forked, or pinnate, with 3–5 veinlets; *sori* between the costule and the margin, small, extending on the more fertile specimens to near the apex of the segments, with a few delicate caducous bullate scales at their base.—"Dāug-păshīn" of the Lepchas.

Hab. Sikkim, on the banks of the Rungbee, at an elevation of 2500 feet. Dr. Anderson and I have also collected it there and on the banks of the Rungjo.

It is an exceedingly handsome species, with a somewhat slender caudex, from 20–40 feet high. It is allied to *A. comosa*, but easily distinguished by its nearly glabrous rachises and costæ, the latter being scaly below, and the more compound venation, which is nearly always simple in *A. comosa*, and again, in the living plants, by its simple or bifurcating caudex void of those adventitious buds so copiously produced by the former, and the large development of woody bundles in the interior of the stem. In the latter character it resembles *A. latebrosa*. The Lepchas, as indicated by their native name "dāug-păshīn," recognize its resemblance to *A. comosa*, their "păshīn," and "dāug," signifying warm, from its being found in the moist tropical valleys. I have also heard it called "sirūh-pălūh," or the black "pălūh."

4. A. COMOSA, Hook. *Unarmed*; stipes paleaceous, with long linear-subulate scales, pale brown, as well as the rachises, which are tawny-villous on the upper side; *fronds* herbaceous and scaleless; *primary pinnæ* 14–16 inches long, 6–8 inches

wide; *pinnules* oblong-acuminate, from a rather broad and truncated sessile or shortly petioled base, serrated two thirds of the way to the costule, pinnatifid, with very narrow sinuses; *lobes* close-placed, oblong, serrated; *veins* rarely forked; *sori* orange-coloured, rather distant between the costule and the margin, nearer the latter (in Sikkim plants always near the costule); receptacle small, very slightly elevated.—Syn. Fil. p. 41; Bedd. Fil. Brit. Ind. t. 84; *Polypodium comosum*, Wall. Cat. n. 319. "Păshīn" of the Lepchas.

Hab. Sikkim, in the temperate forests, at elevations of 5000–6000 feet. On the east-by-south-east flank of the mountain Sinchal it is very abundant, and there forms beautiful groves.

It is the "pashin" of the Lepchas, an interesting and remarkably proliferous species, producing adventitious buds from nearly every part of the surface of the caudex and the bases of the stipes, a peculiarity which has not an origin, as might very naturally be suspected, in the germination of the plant's own spores amongst the appendages of the caudex. It is truly a specific peculiarity, different degrees of organic connexion between the buds and caudex being evident, as I have shown above, in every dissection. This power of reproduction by gemmæ, though a well-known character of the dwarf herbaceous species, has not, so far as I am aware, been hitherto noticed in the caudex of the tree ferns. By the continued production of new buds and the growth of the old, together with the profusion of adventitious roots to which they give origin, many of the plants attain very bulky proportions. Thus one of the plants which I measured on the east flank of Sinchal, at an elevation of 5200 feet, much exceeded in thickness, I believe, any that have been previously recorded. This had an erect caudex 26 feet in height, with eleven main ramifications on the lower parts, varying from 6–10 feet in length, and 10–16 inches in circumference. Six other fully developed shoots from 5–8 feet long had been lately broken off, and then lay by it. The circumference at base of main caudex was 9 feet 10 inches, and immediately under the first ramification, at a height of 4 feet, 7 feet 6 inches; fronds 11–13 feet long, $4\frac{1}{2}$–6 feet broad, with stout stipes $4\frac{1}{2}$ inches in circumference at the base. Another, whose dimensions I had from Mr. Gammie,was 21 feet and 7 feet 8 inches in circumference, with 54 shoots in various stages of development. It presents another peculiarity in the fall of the fronds; in all the other species this is effected gradually, while this is strictly deciduous, and this, singularly enough, at a period when the surrounding vegetation is all in its highest vigour. This is about the middle of August, and of course during the periodical rains, when latent vegetation in any truly indigenous plant would indeed be an anomaly, but preeminently so in the case of ferns, which above all others delight and are most luxuriant (each in its own habitat) in that period of the year when the temperature is highest and the degree of atmospheric humidity greatest. Of the many ferns inhabiting those forests I know of none which affords a parallel to *A. comosa*; all others are vigorous and verdant; it alone stands in great groups, with bare, bulky, and unshapely caudices, conspicuous in their barrenness, and looking like the imperfectly habituated denizens of other climatic conditions.

The extreme height of this species is, I believe, about 25 feet; but this is only attained in the least-proliferous individuals; and much more frequently we find these at from

10 to 20 feet, with fronds 6–10 feet long and 4–5 feet wide, the stipes invested with brown mahogany-coloured scales.

5. A. ANDERSONII, n. sp. *Arborescent*; *caudex* 20–30 feet high; *stipes* muricato-asperous, ebeneous, rather densely clothed below, sparingly upwards, with lanceolate-subulate deciduous scales; *main rachises* tawny-villous above; *fronds* 8–10 feet long, herbaceo-membranaceous, pilose; *primary pinnæ* oblong-lanceolate, acuminate, 12–30 inches long, and 6–9 inches wide; *pinnules* 3–5 inches long, 6–12 lines wide, shortly petiolate downwards, oblong-lanceolate, pinnatipartite, with narrow acute sinuses, and an attenuated serrated apex; *segments* broadly oblong, blunt, serrated; *veins* simple or once forked, and more or less hairy; *sori* 6–14 on each segment, conspicuous, globose, arranged in slightly oblique lines towards the costules, and nearer the latter than the margin; *capsules* mixed with jointed, deciduous hairs.—Bedd. Fil. Brit. Ind. t. 310. "Pălūh-nōk" of the Lepchas.

Hab. In the moister parts of the valleys of the Rungbee and the Rungjo, at elevations of 1000–2500 feet (*Dr. T. Anderson, myself,* and *others*).

This species is most closely allied to *A. glabra,* but at once distinguished by the softly tawny-villose fronds, and the sori more nearly parallel with the midrib than in that species. It has also a much less proliferous habit than *A. glabra*: indeed it is rare to see specimens with even three ramifications from the main caudex; and these always originate from adventitious buds, never, that I have seen, by bifurcation of the axis. It is the "pălūh-nōk" of the Lepchas, or the black "pălūh, as distinguished by its dark ebony-coloured stipe from the light mahogany-brown of those of their "pălūh" (*A. contaminans,* var. *Brunoniana*). Though much less common than the latter species, it is by no means rare. There are others of the Sikkim species with taller stems and larger fronds; yet I know of no more handsome species than this, with its dense corona of beautifully graceful fronds, from 18–20 feet in diameter.

6. A. GLABRA, Hook. *Stipes* asperous, paleaceous at the base, and, as well as the main rachises, purple ebeneous, polished; fronds subcoriaceo-membranaceous; *primary pinnæ* 1½–2 and more feet long, deeply pinnatifid at the apex; pinnules, upper ones sessile, lower ones petiolate, from a truncated base, oblong-acuminate, 3–6 inches long, 5–9 lines wide, pinnatifid from one fourth to halfway to the costule, rarely more; lobes triangular or rounded, rarely ovate, serrated; *veins* pinnate, veinlets all simple; sori on most of the lobes, generally arranged in the shape of a V inverted, not extending to the apex of the lobe.—Syn. Fil. p. 43; Moore, Ind. Fil. p. 50; Bedd. Fil. Brit. Ind. p. 22, t. 60; *Polypodium altissimum,* Wall. in herb. 1820; *Cyathea venulosa,* Wall. Cat. n. 180; *Polypodium giganteum,* Wall. Cat. n. 321; *Polypodium*? *umbrosum,* Wall. Cat. p. 64; *Polypodium sexpedale,* Hamilt. MS. "Pălūh-kūp" of the Lepchas.

Hab. In Sikkim strictly confined to the tropical valleys, occurring on the banks of the Teesta at elevations of 800 feet. I have also found it in a thicket near to the Ganges and Darjeeling road beyond

Gareedhovra; and I suspect it is the same species which, Dr. Anderson informs me, is so abundant in the forests of the Dulha Jhar, from two to three miles south of the Balasun river, and about six miles from Punkabaree.

An interesting species, with an exceedingly proliferous and occasionally dichotomous caudex. In the Sikkim valleys it varies from 6 to 15 feet in height, and in this respect differs from the lofty specimens of the Khasia hills, Malayan peninsula (50 feet high, Wall.) and islands. It is, as remarked in the Sp. Fil., "so variable in the form and size of the pinnules in our copious specimens, that it is scarcely possible to define them in words" . . . . . "on some specimens 2–4 inches long by $\frac{1}{2}$ an inch broad, on others 6 inches long and 1 inch broad; segments also varying much in length and in the depth of the sinus." I may add, it also varies much in the venation, and even in the position of the sori, though the more or less V-shape is very characteristic. These variations are shown in many figures of the pinnæ of this species from two plants which I collected in Sikkim. In the first three specimens, from one plant, the venation varies from simple to forked, with the veinlets occasionally uniting again before they reach the margin; sori on one segment parallel to and placed nearly on the margin, in the other tending to the triangular arrangement, though distant from the costule. In the series from the other plant the venation is simple and forked, the sori are marginal and obliquely tending towards the costule.

DESCRIPTION OF THE PLATES.

Plate I.

Fig. 1. Portion of the base of caudex of *Alsophila latebrosa*: *a–b* entire, showing the slender tapering inferior extremity; *b–c* in longitudinal section, showing the sudden expansion of the caudex towards the upper extremity, and the reduction of the interspaces between the fronds—*b* being the point of origin of the 20th frond, while in the shorter portion between this and c^1 30 fronds are given off. Nat. size.

Fig. 2. Transverse section of the caudex of *A. latebrosa*: *a*, epidermal layer; *b–b*^{5}, stipes in different stages of development; *c*, woody laminæ, consisting of an outer layer of dark-brown pleurenchyma (c^1), a stratum of parenchyma (c^2), and a central layer of pale-brown trachenchyma (c^3); *d*, central parenchymatous mass, with imbedded fibro-vascular bundles, *e*. Nat. size.

Fig. 3. Longitudinal section of the woody laminæ of the above prepared by maceration, showing the arrangement and shape of the frond-meshes—with recurved margins, from which branches are given off to the latter. Nat. size.

Fig. 4. Transverse section of the caudex of *Hemitelia decipiens*; the references are the same as in fig. 2; adventitious roots concretions of cellular tissue resembling the free vascular bundles. Nat. size.

Plate II.

Figs. 1 & 2. Lower and upper surfaces of a half-inch-thick section of the caudex of *Alsophila comosa* at

the growing-point: fig. 1, upper; fig. 2, lower surface; *a*–*a*⁴, fronds in different stages of development; *b*, the incipient woody laminæ arranged on the flattened apex, indicating the points of origin of future cycles of fronds, *c*. Nat. size.

Fig. 3. Lower section of the same, showing the normal distribution of the vascular system: *a*, epidermal layer; *b*, adventitious roots; *c*, woody laminæ; *d*, central parenchyma; *e*, bases of fronds in various stages of development. Nat. size.

Fig. 4. Another section of the same, with similar references, showing the derangement in the distribution of the vascular system caused by the development of adventitious buds, *f*. In the most perfectly developed bud secondary ones are observable as round protuberances of cellular matter, *g*. Nat. size.

Figs. 5 & 6. Outer and inner view of the base of the stipes of the above, showing the stipal loculi arranged in an intramarginal line. Nat. size.

Plate III.

Figs. 1 & 2. Outer and inner surface of the base of a stipe of *Alsophila latebrosa*, showing the large elliptical loculi continued laterally upwards along the stipe, in the line of the pinnæ, fig. 1, external surface: *a*, basal loculi; *a*¹ lateral loculi; *b*, adventitious rootlets; fig. 2, internal surface, with similar references, showing the enlarged saccate appearance of the loculi; *c*, the fibro-vascular bundles of the stipe. Nat. size.

Fig. 3. Transverse section of the growing-point of a caudex of *A. latebrosa*: *a*, bases of the young fronds; *b*, woody laminæ, showing the demarcation of the points of origin of future fronds (*c c*) and illustrating the independence of the origin and distribution of the vascular system on the latter organs. Nat. size.

Fig. 4. A lateral section of the above, similarly prepared, but representing more clearly the arrangement and peculiar ramifications of the vascular bundles: *a*, stipal loculus; *b*, scales of the stipes; *c*, prolongation of the woody laminæ beyond the developed frond-region to near the growing apex of the axis. Nat. size.

Fig. 5. Base of a stipe of the above species extracted from the caudex, with its elongated free vascular bundles: *a*, the armed epidermal layer; *b*, base of the stipe; *c*, diaphragm of frond; *d*, woody laminæ; *e*, the inosculatory and ramifying bundles. Nat. size.

Plate IV.

Figs. 1, 2, & 3. Transverse sections from living and dried caudices of *A. contaminans*, var. *Brunoniana*, for comparison of the vascular system in the different states: figs. 1 & 2, from living specimens; fig. 3, from a dried caudex.

Fig. 4. Longitudinal section of *Alsophila glabra*: *a*, epidermal layer; *b*, adventitious roots; *c*, base of stipes; *d*, young fronds; *e*, woody laminæ, continued out into the frond *e'*; *f*, free woody bundles; *g*, central parenchyma. Nat. size.

Fig. 5. Transverse section of the same, with similar references. Nat. size.

Plate V.

Fig. 1. Longitudinal section of the trifurcate caudex of *Alsophila ornata*: *A* & *B*, shoots originating in a true bifurcation of the apex; *a*, epidermal layers; *b*, woody laminæ; *c*, points of origin of the

fronds; *d*, central parenchyma; *e*, fibro-vascular bundles imbedded in the latter; *b*, apex of the third and least-developed shoot. Nat. size.

Fig. 2. Base of the frond of the same, showing the form and arrangement of the stipal loculi. Nat. size.

Fig. 3. Longitudinal section of the base of a young stipe, exhibiting the diaphragm (*a*) of the frond. Nat. size.

Fig. 4. Longitudinal section of shoots *A* and *C*, showing the origin of the latter also in a division of the stem. Its somewhat lateral position is due to the more vigorous development of the others. The references are the same as in the above; *f*, the undulating surface, is here due to the partial decay of the young fronds; *g* & *h* have reference to the following sections. Nat. size.

Fig. 5. Transverse section of the undivided caudex of the above at the point *g* in fig. 4, showing marked irregularities in the distribution of the vascular system, and a partial lobing of the caudex, indicating the commencement of the subsequent bifurcations: *j*, an adventitious shoot; *k*, adventitious roots enveloping the epidermis. The other letters correspond with the previous figures.

Figs. 6 & 7. Lower and upper surfaces of sections at the points *h* and *i* in fig. 4. Fig. 6 exhibits the lower surface, and shows a ternary segregation of the woody laminæ, and the origin of another adventitious shoot at the point *l*. Fig. 7, of the upper surface, exhibits clearly the completed ternary division. *m*, horizontal woody plates continuous with the main woody framework, but unprojected laterally, apparently from the derangement of the vegetative forces, consequent on the trifurcation of the caudex. The other references agree with those above. All the above sections are of the natural size.

Plate VI.

Fig. 1. External portion of a dried caudex of *Alsophila latebrosa* cleared of the bases of the stipes, so as to show the regular arrangement and form of the scars in that species. Nat. size.

Fig. 2. Vertical section of the caudex in the line of two frond-scars, exhibiting the free woody bundles in the central parts of the scar, and the origin of the others from the main woody framework. Nat. size.

Fig. 3. A scar separated, with its woody laminæ, showing below a portion of the loop of a lower frond: *a*, the branching-off of a marginal series of bundles, *b*, which pass along the periphery of the stipe; *c*, *d*, the diaphragm of the frond, exhibiting the arrangement of the free vascular bundles, *e*. Nat. size.

Fig. 4. A portion of the rhizome of *Polypodium proliferum* prepared by maceration: *a*, central parenchymatous axis; *b*, vascular bundles giving off branches to the fronds, *c*. These branches, it will be observed, pass off indifferently from the inosculations and intermediate parts of the bundles. Nat. size.

Fig. 5. Sections of the tubers of *Nephrolepis cordifolia*, showing the reticulated marginal distribution of the vascular fibres on the main parenchymatous mass. Nat. size.

Fig. 6. Longitudinal section of the dichotomous caudex of *Nephrodium molle*, with its very imperfectly developed woody system surrounded by a dense mass of adventitious roots, from which protrude the stout knob-like bases of the old, though still living, stipes. Nat. size.

Plate VII.

Fig. 1. Longitudinal section of the stem of *Asplenium esculentum*, showing the irregular distribution of the vascular bundles as compared with that of tree ferns. Nat. size.

Fig. 2. Portion of the woody framework of the same, prepared by maceration : *a*, the continuation of the woody laminæ from the margins of the meshes, *b*. Nat. size.

Fig. 3. Transverse section of the same near the base of the caudex, with the irregularly distributed vascular bundles (*a*) in the parenchymatous axis (*b*), the epidermal layer (*c*), the adventitious buds (*d*), the stipes (*e*), and a thick matting of adventitious roots (*f*). Nat. size.

Fig. 4. A similar section higher up on the axis, which shows a considerable reduction in the diameter of the caudex, and a more regular distribution of the vascular system. The references agree with those in the previous figure. Nat. size.

Figs. 5 & 6. Sections of the stipe, with two T-shaped woody laminæ in the basal section (fig. 5), uniting upwards, as shown in the higher section (fig. 6). Nat. size.

Figs. 7–14. Sections of the stipes of the several species of tree ferns subsequently described, showing the differences in the arrangement of the free vascular system in the respective species: fig. 7. *Cyathea spinulosa*, near the base; fig. 8, higher up on the stipe; fig. 9. *Alsophila latebrosa*; fig. 10. *A. contaminans*, var. *Brunoniana*; fig. 11. *A. ornata*; fig. 12. *A. comosa*; fig. 13. *A. Andersonii*; fig. 14. *A. glabra*. All nat. size.

Fig. 15. Longitudinal and transverse sections of the rhizomes of *Acrostichum scandens*. The vascular system is concentrically arranged in from 10 to 14 isolated bundles, and inosculate somewhat rarely. The transverse sections exhibit a larger central bundle, with a median ring, a zone of slender isolated bundles, and a second on the periphery composed of still more tiny bundles. The thickened bundles, *a*, correspond with the side of the attachment of the rhizome. Nat. size.

Fig. 16. Longitudinal and transverse sections of the rhizome of *Polypodium phymatodes*: *a*, transverse section of rhizome and base of a stipe; *a'*, pulvinus; *b*, transverse section of rhizome and an offshoot; *c*, transverse section of rhizome; *e*, the same of a stipe; *d*, longitudinal section of rhizome and stipe. Nat. size.

Plate VIII.

Fig. 1. Portion of the caudex of *Cyathea spinulosa*, showing the large obovate scars, the small elliptic stipal loculi interspersed amongst the impressions of the adventitious roots, of which some of the latter are still attached below the scars on the right hand. Nat. size.

Fig. 2. Portion of the caudex of *Hemitelia decipiens*, with the strongly armed persistent bases of the stipes partially enveloped in the dense mass of stout elongated adventitious roots. The stipal loculi are shown around the base of the upper central frond, but more clearly in the detached base, fig. 3. Nat. size.

Plate IX.

Fig. 1. Portion of the caudex of *A. contaminans*, var. *Brunoniana*, a short way below the apex, enveloped below in the adventitious roots, upwards in scales. The scars on this species are very prominent, with the exserted ends of the vascular bundles.

Fig. 2 is a detached base of a stipe, showing the basal loculi, which are very numerous on this species, and of very irregular shapes. Nat. size.

Fig. 3. Trifurcated apex of the caudex of *A. ornata*. The adventitious roots in this species, unlike some of the others, originate almost entirely from the base of the stipe, extending round it in a linear verticillate manner, as shown in the figure. Nat. size.

Plate X.

Fig. 1. Portion of the caudex of *A. comosa*, exhibiting the closely set protuberant scars with their markedly proliferous bases. The specimen represented is from near the upper portion of a somewhat

slender caudex, as showing best the frond-scars and points of origin of the offshoots, which are completely hid in the lower parts with the adventitious roots. At the lower left-hand corner of the figure a strong perfectly developed shoot has its origin, while upwards very many others in various stages of development are shown. Nat. size.

Fig. 2. An aborted shoot of a normal bifurcation of the main axis, which is now with difficulty distinguishable in structure from an adventitious bud from the base of the stipe: *a*, epidermal layers; *b* and *b'*, the inner and outer strata of the woody laminæ; *c*, vascular bundles of the shoot; *d*, a loculus of the stipe; *e*, *e*, part of a progeny of buds which surrounded the whole surface of the shoot; *f*, the partially decayed apex.

Fig. 3. Base of stipe, showing loculi and adventitious buds.

Fig. 4. Section of base of stipe, showing diaphragm.

Plate XI.

Fig. 1. Portion of a young caudex of *Alsophila Andersonii*, with the stout persistent bases of the fronds all densely covered with scales.

Fig. 2 is the base of a stipe denuded of scales, to exhibit the disposition and form of the loculi, which are in both respects very irregular. Nat. size.

Fig. 3. Portion of the caudex of *A. glabra*, which, unlike most of the other species, has the long persistent bases of the stipes overlapping each other in linear lines, giving it an appearance altogether unlike any other tree fern with which I am acquainted. It is singularly proliferous, giving off buds somewhat indifferently from stipes and caudex. The lineal superposition of the fronds is the cause of another peculiarity, in the adventitious roots having first an upward ascent until they reach the broken extremity of the frond below; thence they pass downwards in a curving radial manner, as shown in the figure. Nat. size.

Fig. 4. Base of stipe of *A. glabra*, showing loculi and adventitious rootlets.

Plate XII.

Fig. 1. Longitudinal section of half the apical portion of the caudex of *Euterpe oleracea*, exhibiting the arrangement of the vascular system: *a*, the central parenchymatous mass sparingly interspersed with woody bundles; *b*, a dense zone of the latter, curving round below the flattened apex to the developing bud; *c*, the looser-structured external zone, with the bundles partly arranged parallel to the axis, and partly in an irregular curving manner; *d*, the latter bundles, which have their origin at a later period than the former, and are, moreover, characterized by growth at both extremities, the upper growing up into the frond, the lower downward in the caudex; *e*, bases of the fronds, with the nascent inflorescences, *f*, in their axils; each frond, it will be observed, originates in the sheathing base of its predecessor. Nat. size.

Fig. 2. Apical section of the stem of *Cycas revoluta*, Thunb., exhibiting the straight involute vernation, and differing from palms in the free origin of each frond on the apex, as is the case with tree ferns: *a*, central parenchyma; *b*, woody layers; *c*, the external layers of parenchyma, interspersed with fibro-vascular bundles.

Fig. 3. Seedling plant of *Cycas Rumphii*, Miq. (*C. circinalis*, Roxb.), four months old, in longitudinal section: *d*, the central vascular bundle of the main root; *e*, adventitious roots; *f*, the hardened spermoderm; *g*, the perisperm; the other references as in the previous figure. Nat. size.

The venation in this species also is straight and involute; and the young frond at the stage represented in the figure is not unlike the fertile branch of the Ophioglossums.

Fig. 4. An unfolding frond of *Cycas sphærica*, Roxb., showing the involute character of the vernation. Nat. size.

Fig. 5. Section of a three-months-old seedling of *Cycas pectinata*, Griff., which also shows, even from the first frond, the involutely folded pinnæ, without the slightest disposition to curvature of the rachis. Nat. size.

Plate XIII. a.

Cyathea spinulosa, Wall.: fig. 1. Portion of a frond, nat. size; fig. 2. Portion of the rachises with two pinnæ; fig. 3. An upper view of a portion of the rachis; fig. 4. Segments with sori, magnified; fig. 5. Magnified barren segment, showing the venation.

Plate XIII. b.

Alsophila latebrosa, Hook.: fig. 1. Portion of a frond; fig. 2. Portion of the rachis; fig. 3. Pinnæ: all nat. size. Fig. 4. A magnified soriferous segment; fig. 5. A magnified barren segment, showing the characteristic venation.

Plate XIV.

Hemitelia decipiens, Scott: fig. 1. Portion of a frond, nat. size; fig. 2. Portion of the rachis; fig. 3. Pinnæ, nat. size; figs. 4–7. Magnified segments exhibiting the venation and variations in the degree of development of the involucre; fig. 8. A magnified barren segment; figs. 9–11. Sori, more magnified.

Plate XV.

A. contaminans, Wall., var. *Brunoniana*: fig. 1. Portion of a frond, nat. size; fig. 1 *a*. Two fertile pinnæ, nat. size; figs. 2 & 3. Portions of the rachis, exhibiting its entirely unarmed lower and upper surfaces; fig. 4. A magnified sporiferous segment; fig. 5. Portion of the strongly armed rachis of *Alsophila contaminans*, Wall., for comparison with the unarmed rachis of the var. *Brunoniana*; fig. 6. A magnified barren segment, showing the venation; fig. 7. Paleæ of the base of the stipe, nat. size.

Plate XVI. a.

Alsophila ornata, n. sp.: fig. 1. Portion of a frond; fig. 2, of the rachis, showing the upper surface; and fig. 3, of two pinnæ: all nat. size. Fig. 4. Magnified fertile pinna; and fig. 5. A sterile pinna, to show the venation.

Plate XVI. b.

Alsophila comosa, Wall.: fig. 1. Portion of a frond; fig. 2, of the rachis, showing the upper surfaces; and fig. 3, of two pinnæ: all nat. size. Fig. 4. Magnified fertile segment; fig. 5. A barren segment, to show the venation.

Plate XVII.

Alsophila Andersonii, n. sp.: fig. 1. Portion of a frond; fig. 2, of two pinnæ: nat. size. Figs. 3 & 4. Magnified segments, the former fertile, the latter sterile, showing the venation; fig. 5. A receptacle, more magnified, showing the jointed hairs.

Plate XVIII.

Alsophila glabra, Bl.: figs. 1 & 2. Portions of different fronds from a single plant, showing the differences in the form and cutting of the pinnæ. Nat. size.

Figs. 1 *a*, 2 *a*, & 3 *a*. Segments from a single plant, showing the variations in the position of the sori; and figs. 1 *b*, 2 *b*, and 3 *b*. Magnified segments of the same; figs. 4 *a*, 5 *a*, and 6 *a* are pinnæ from another plant, all nat. size; and 4 *b*, 5 *b*, and 6 *b* are magnified segments to show the variability of the venation.

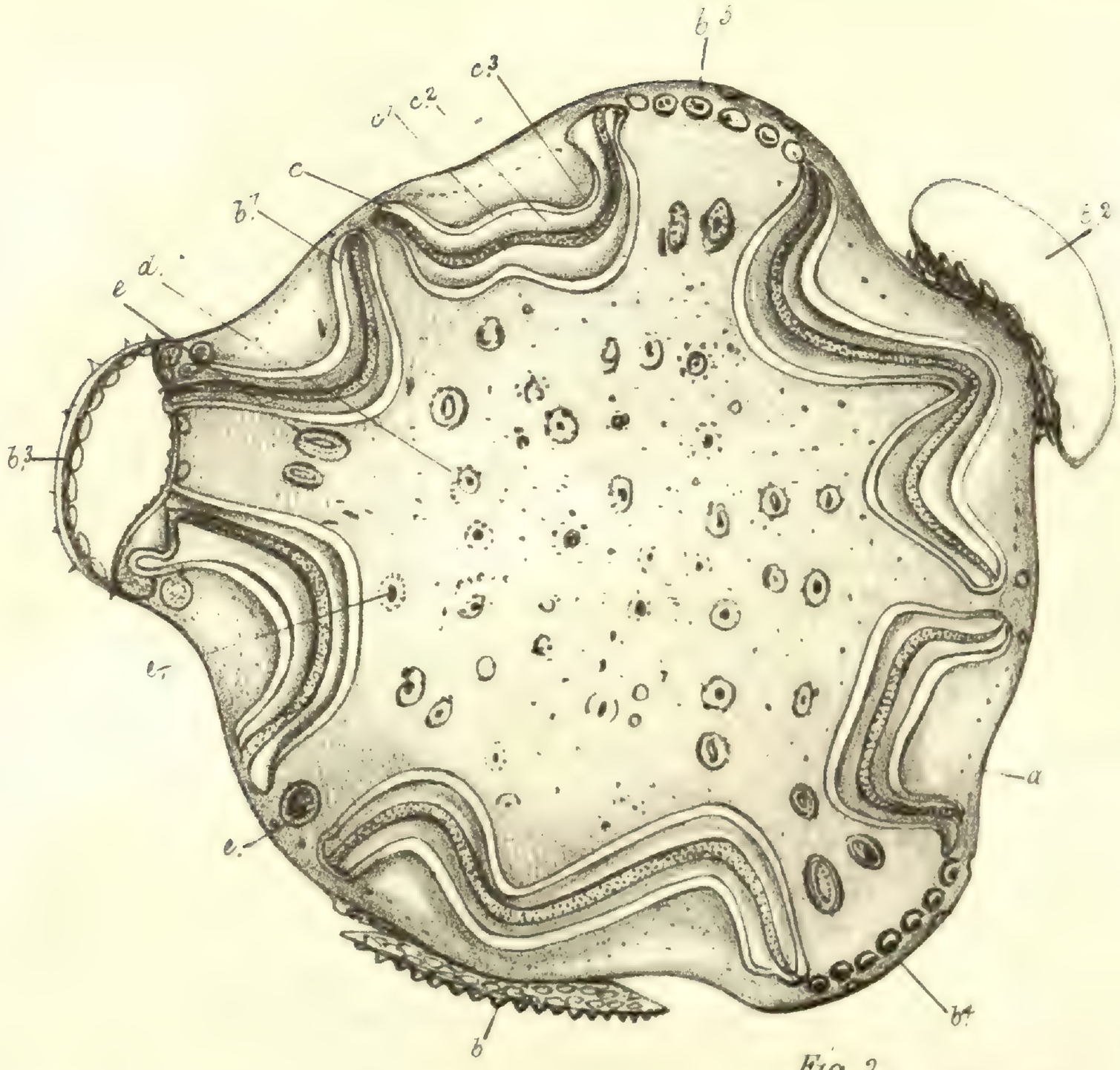


Fig 2

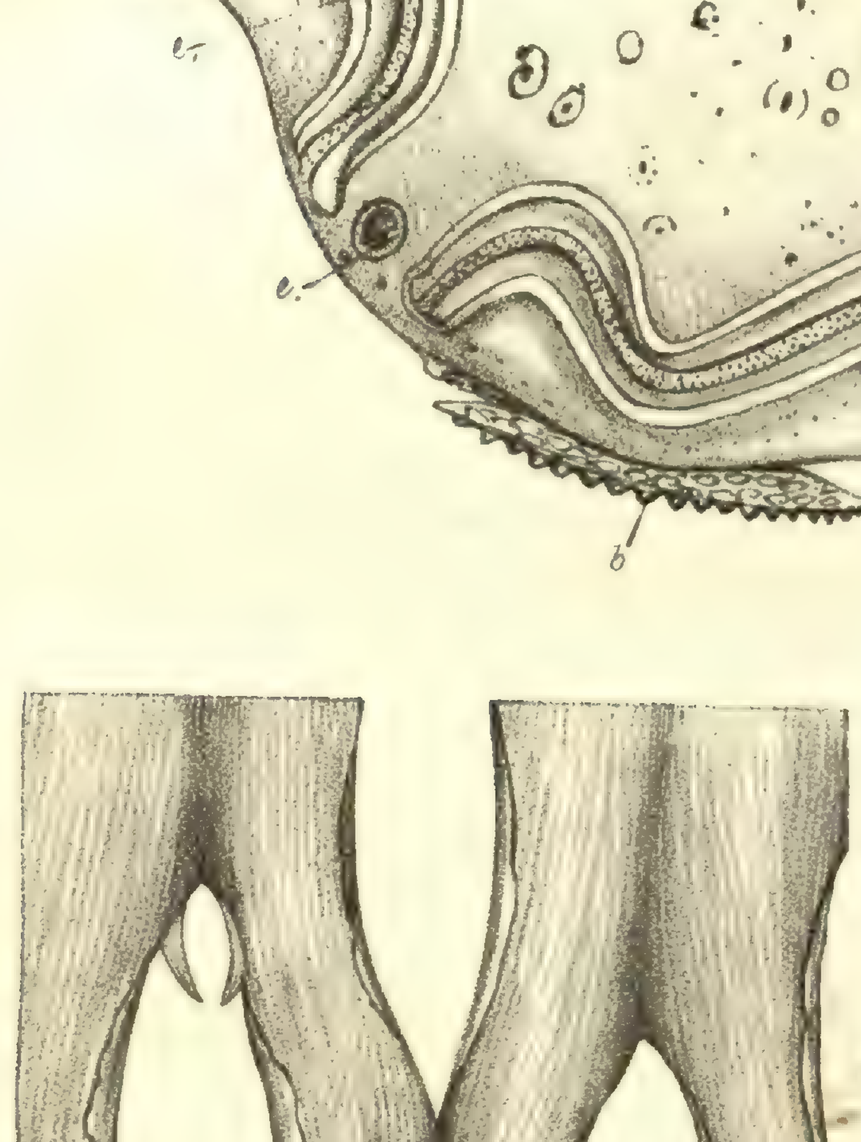


Fig. 3

Fig. 4

W H. Fitch del

J. N. Fitch imp

Figs 1 3 Alsophila latebrosa *Hk.*
Fig 4 Hemitelia decipiens *Scott.*

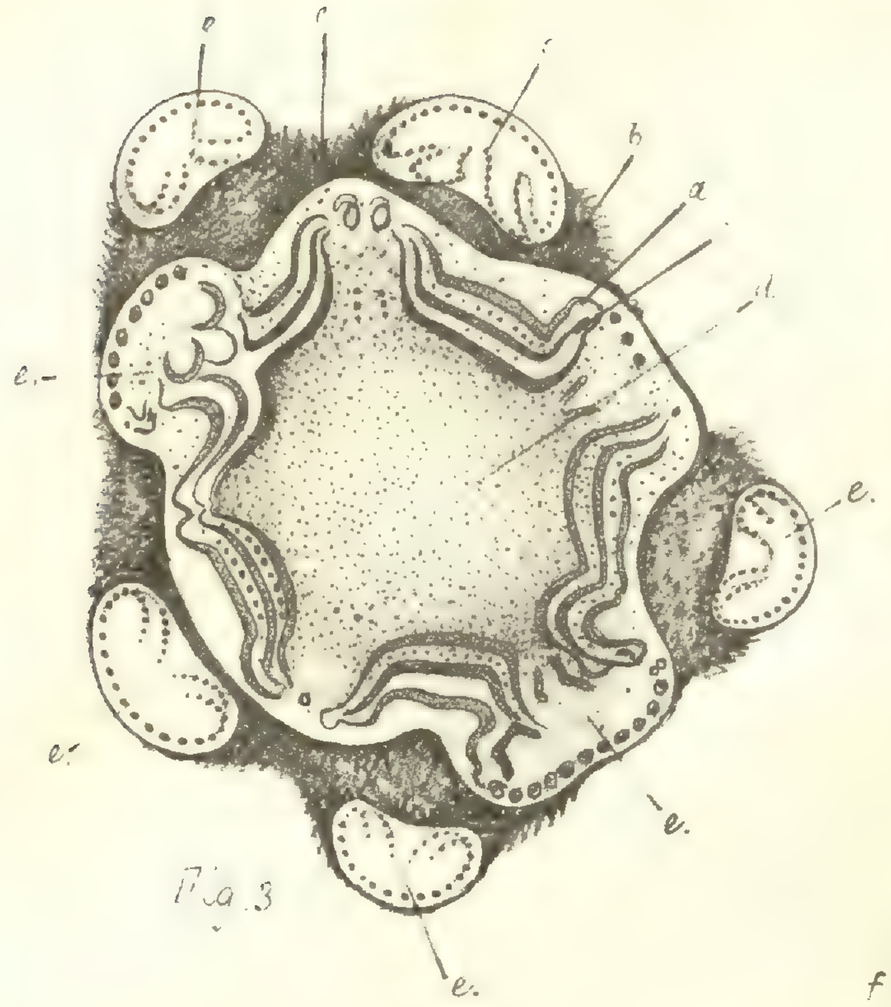
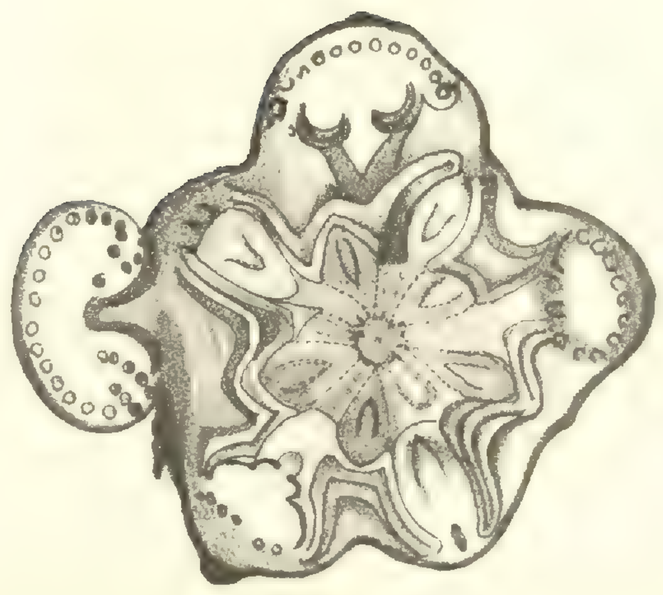


Fig. 3



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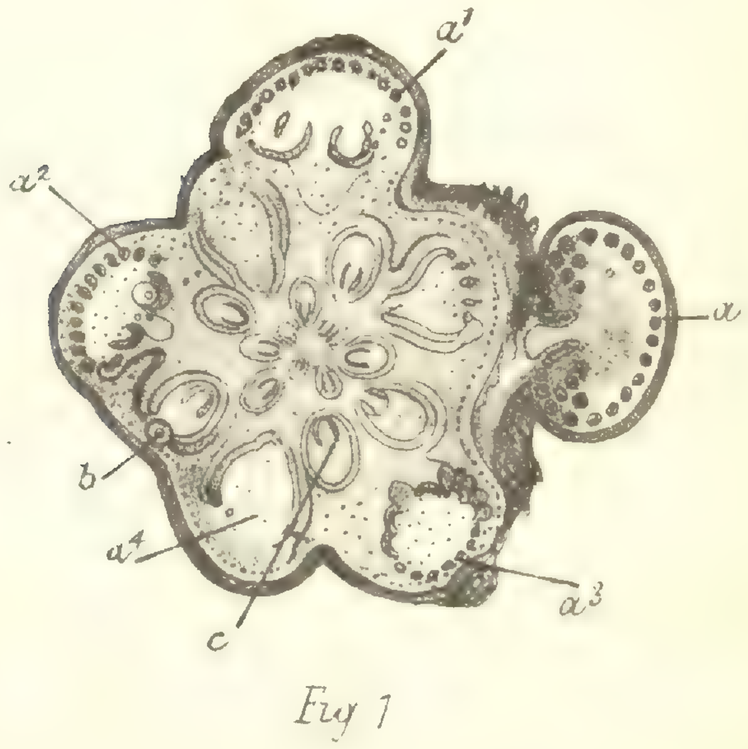
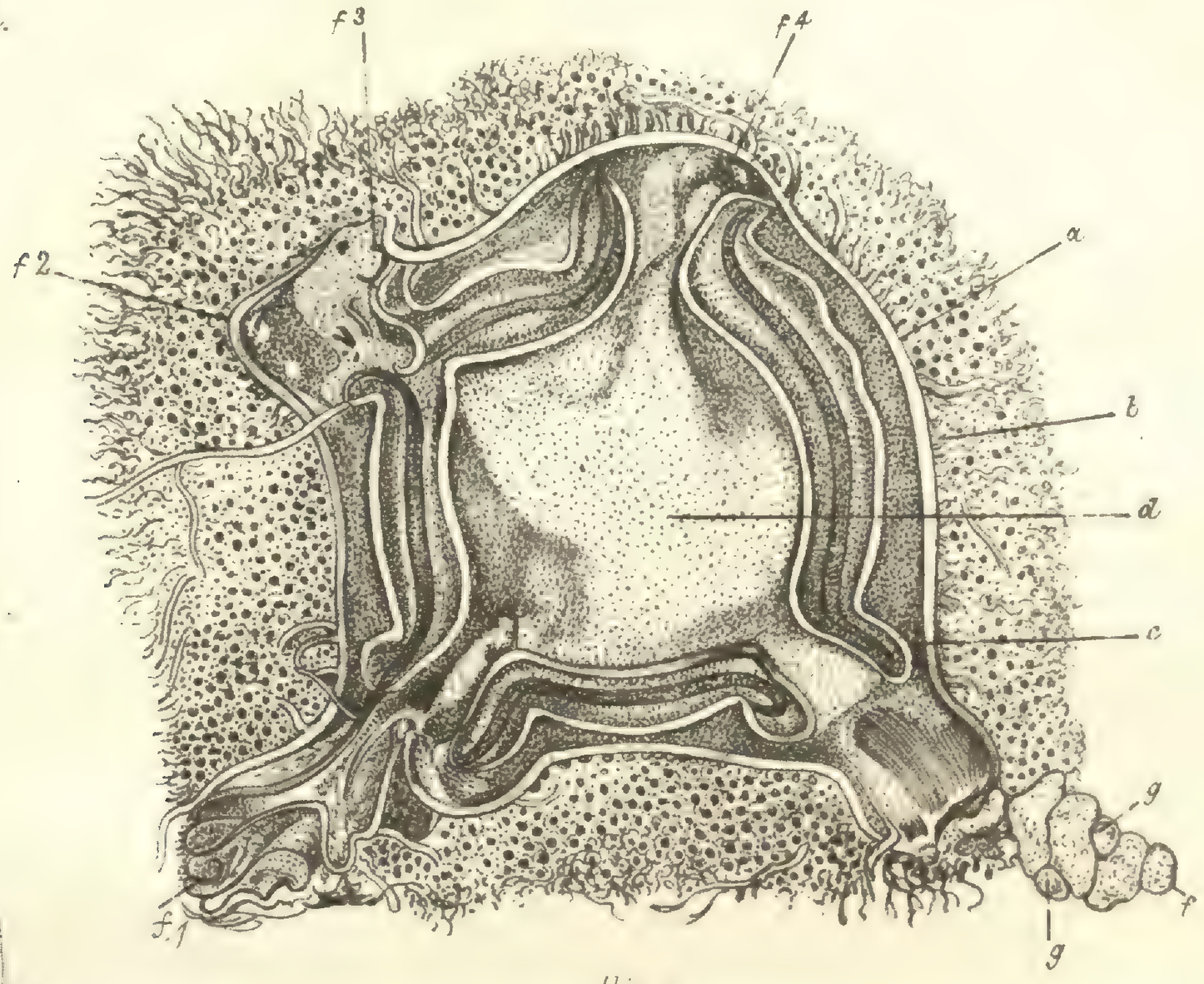


Fig 1



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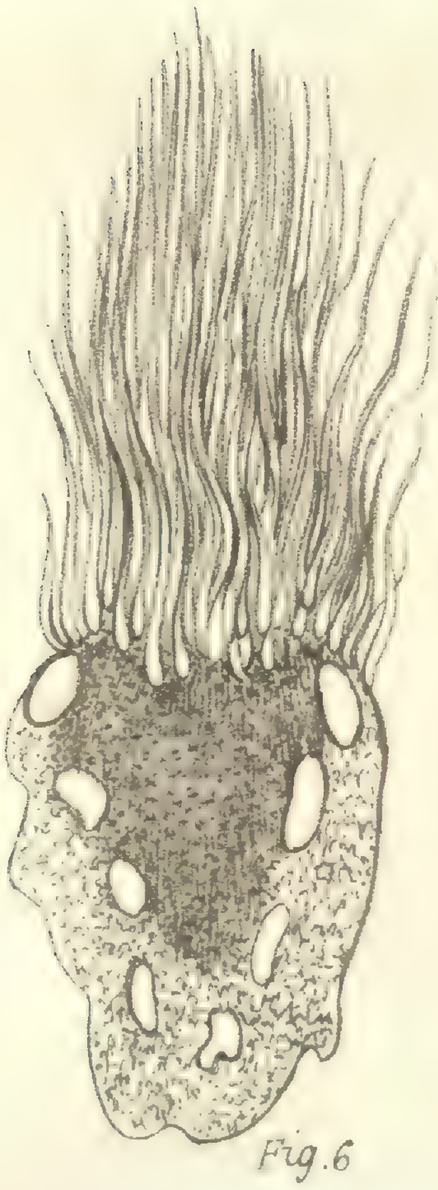


Fig. 6

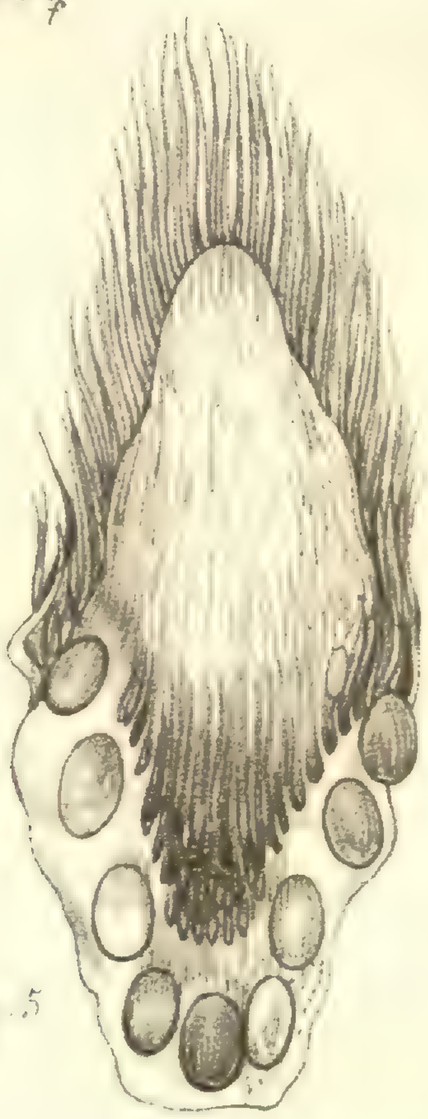


Fig. 5

W. H. Fitch del et lith.

J. N. Fitch imp.

Alsophila comosa. *Hk.*

Fig. 1

Fig. 2

Fig. 4

Fig 5

Fig 3

W.H. Fitch del. et lith.

J. N. Fitch imp.

Alsophila latebrosa. Hk.

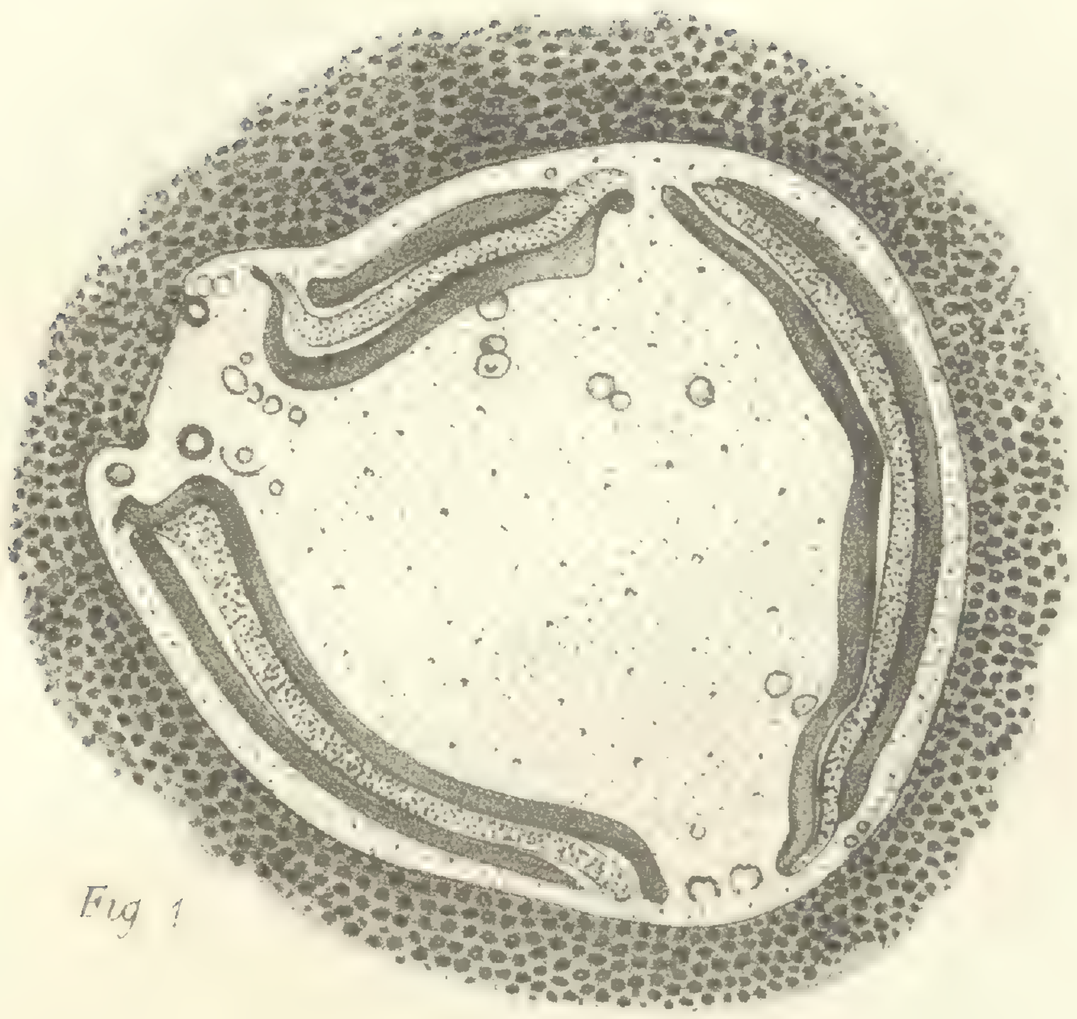


Fig 1

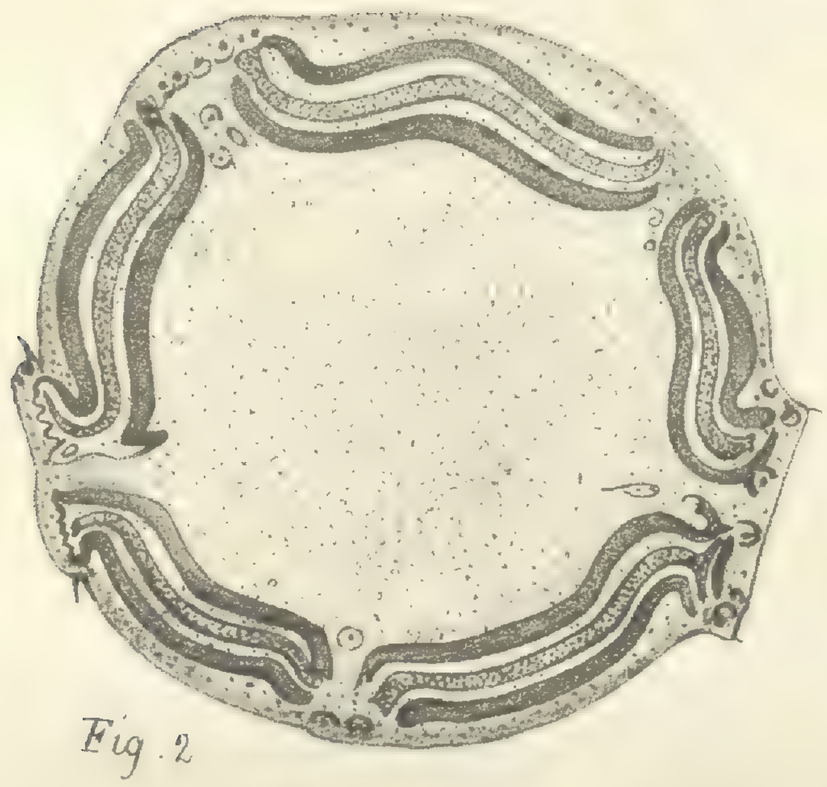


Fig. 2

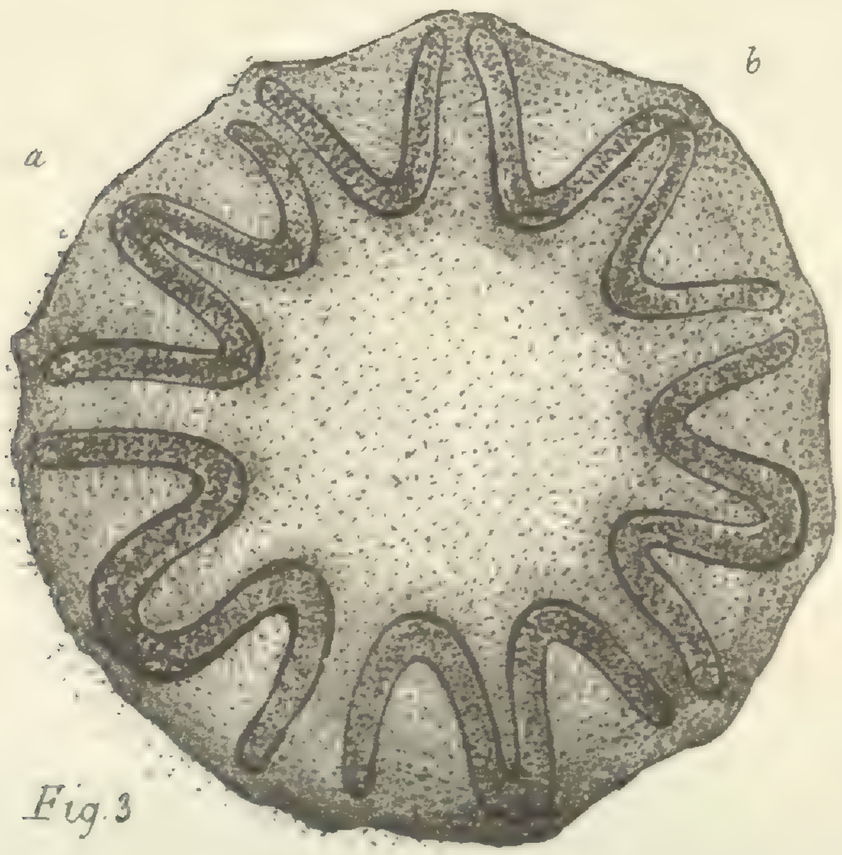


Fig. 3

Fig. 4

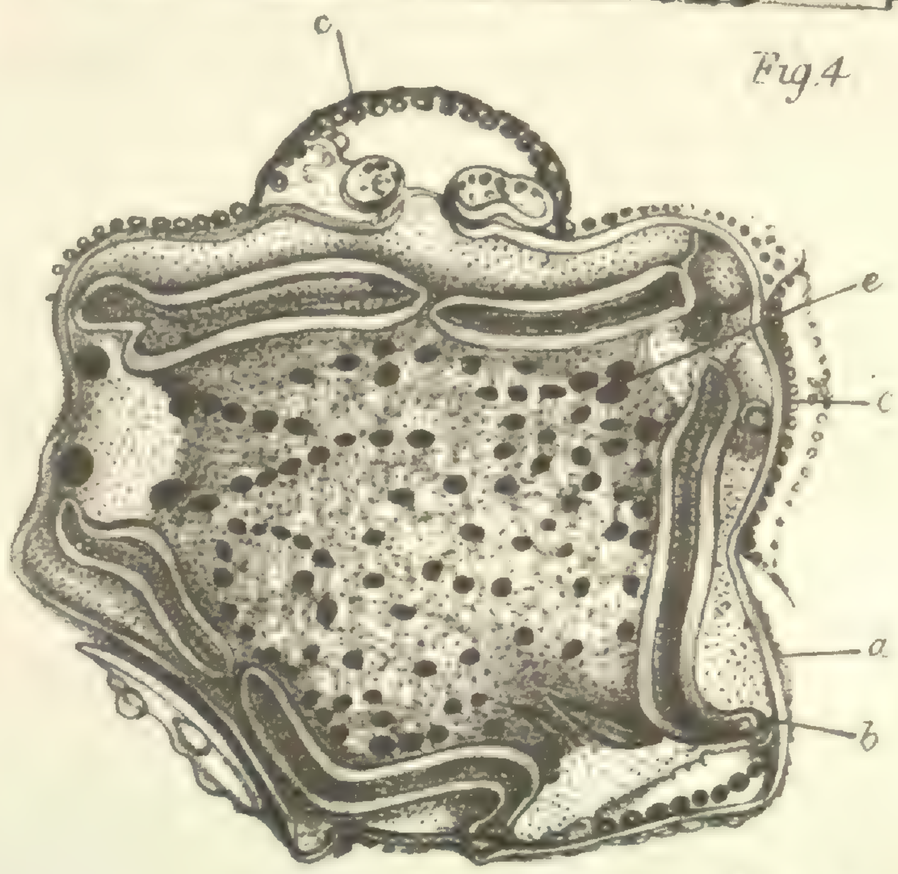
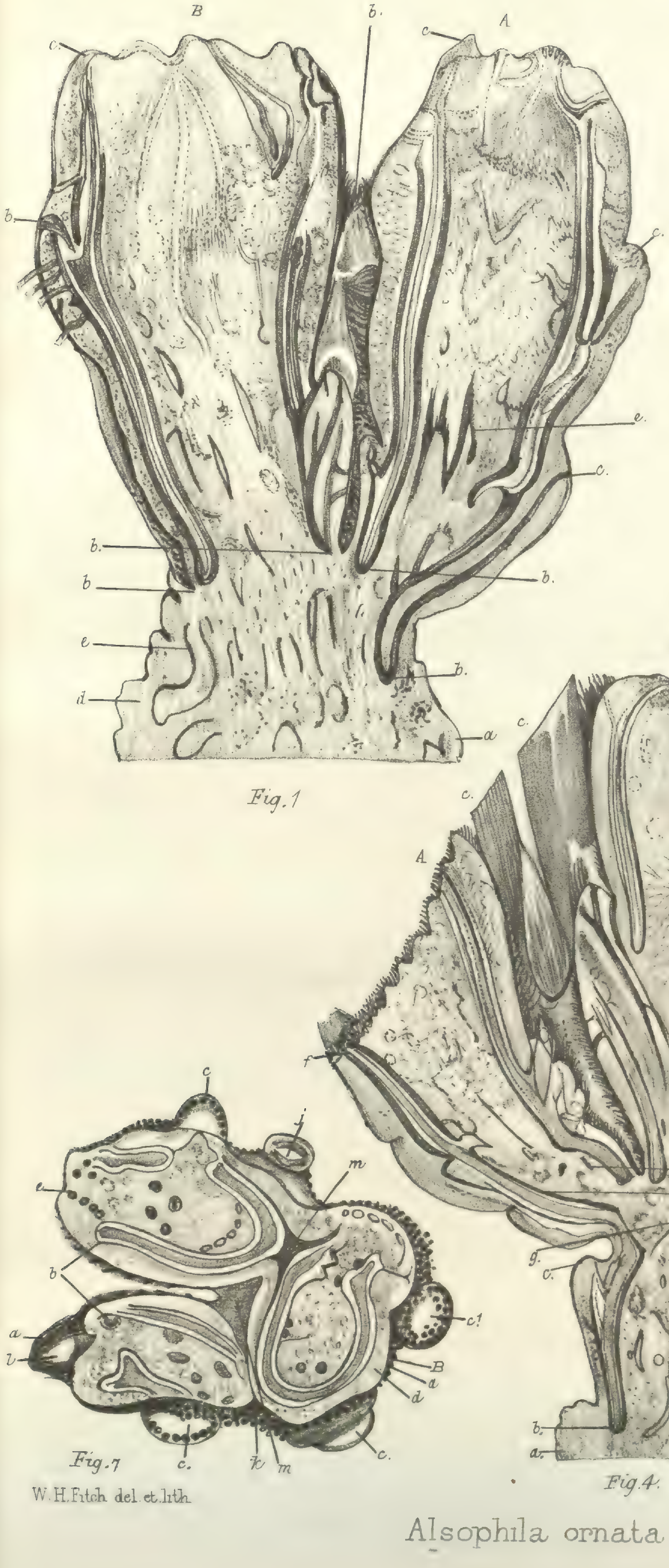


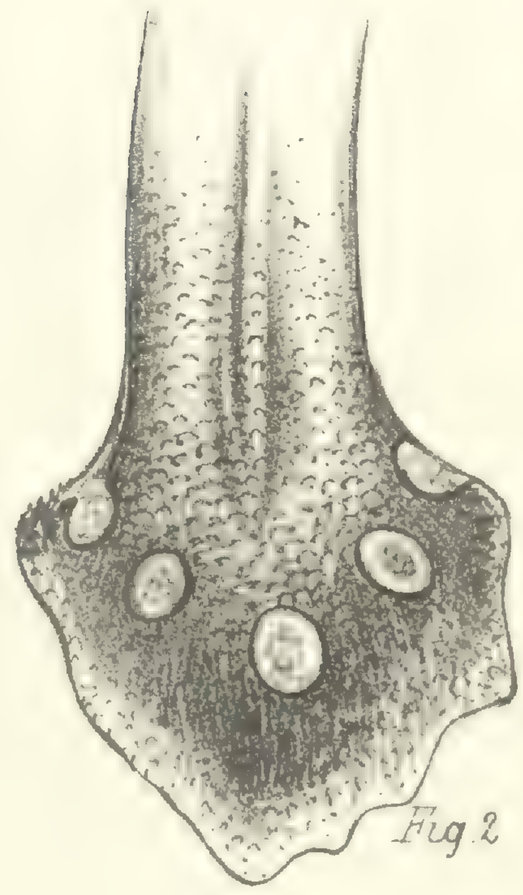
Fig. 5

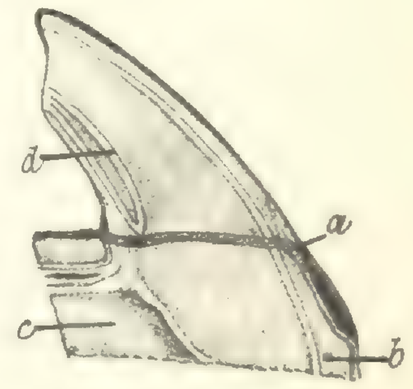
W.H. Fitch del et lith.

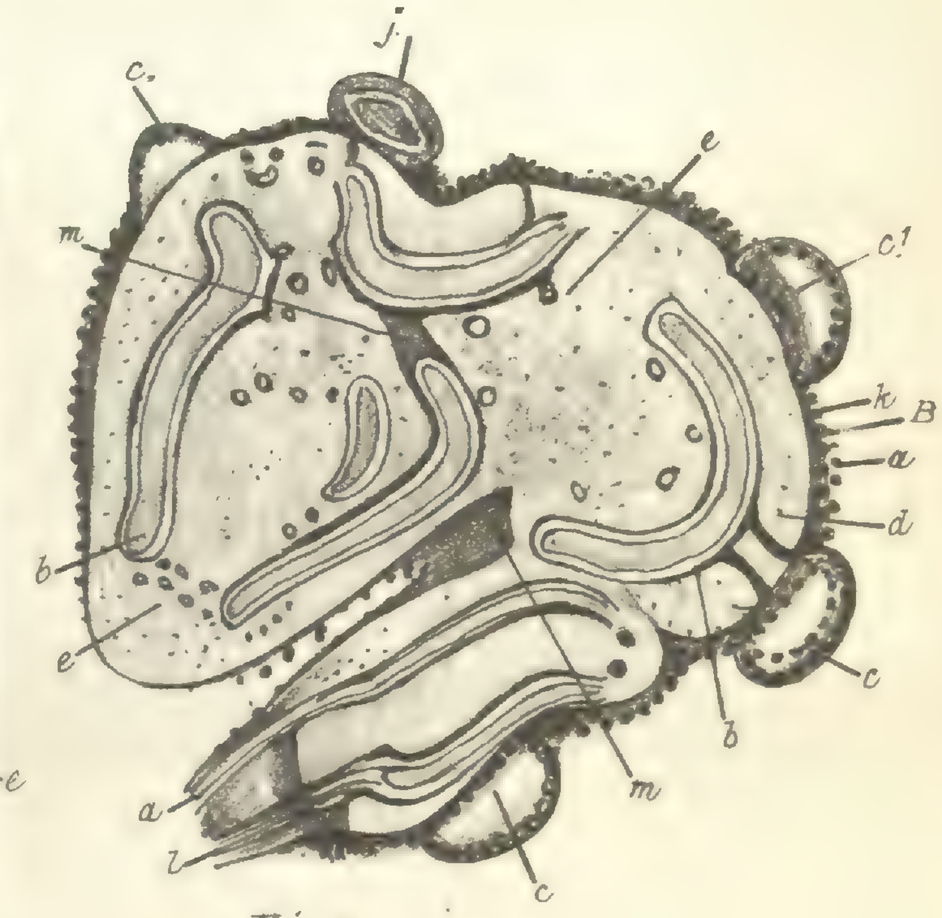
J.N. Fitch imp

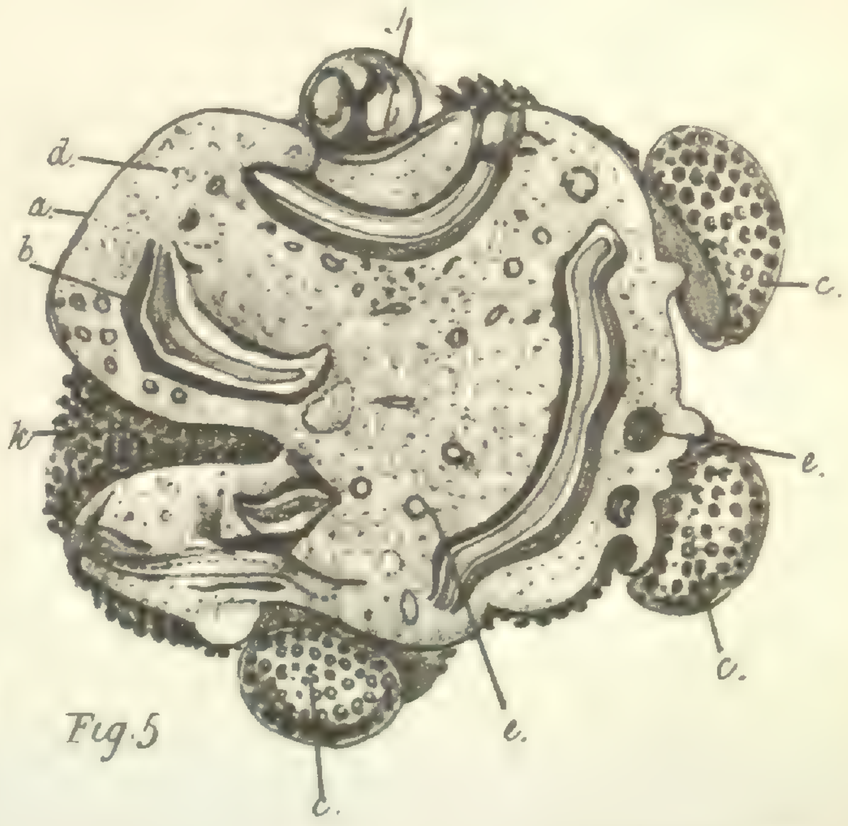
Figs. 1, 3. Alsophila contaminans *Wall* var. *Brunoniana*.











W. H. Fitch del. et lith.

J. N. Fitch imp

Alsophila ornata *Scott*.

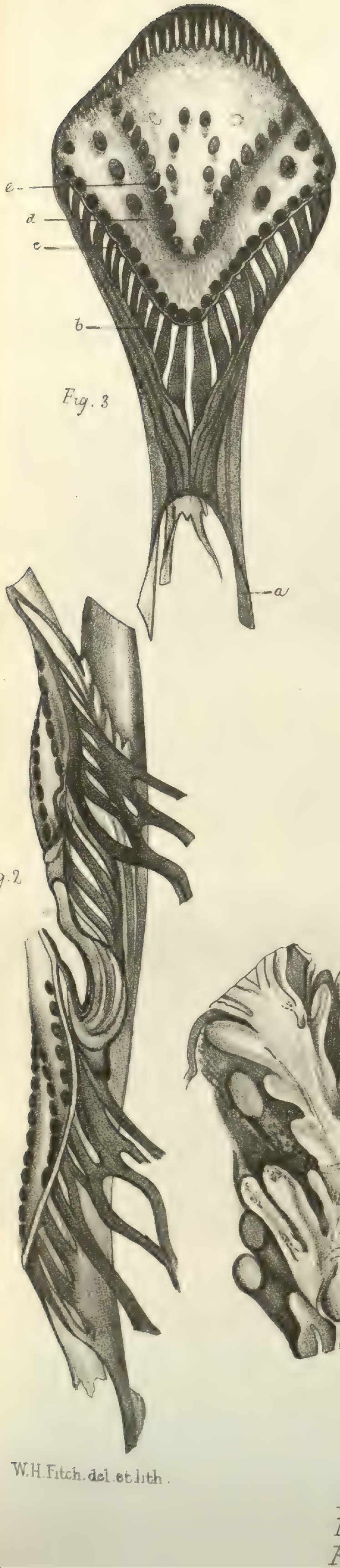


Fig. 3

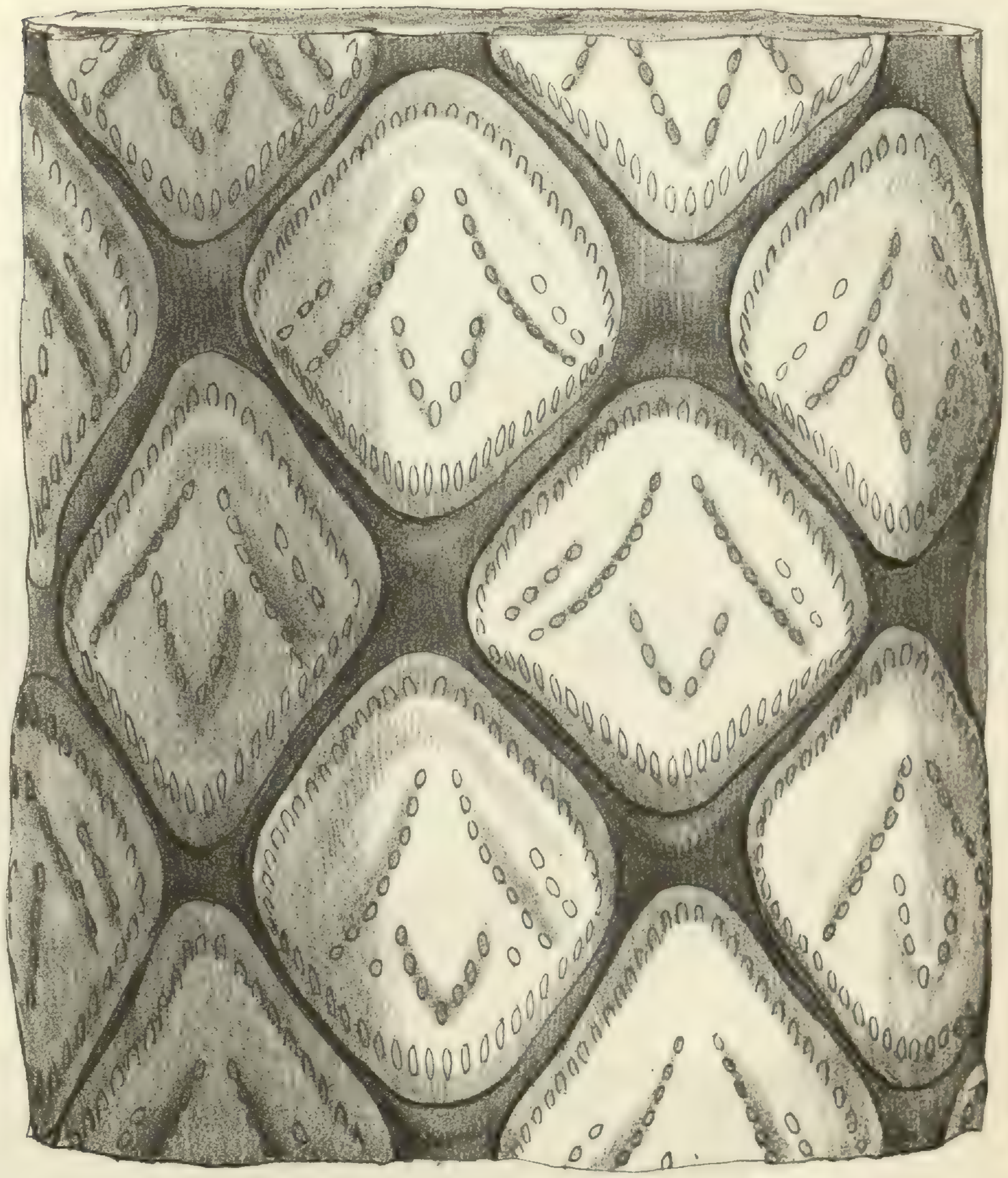


Fig. 1

Fig. 2

Fig. 6

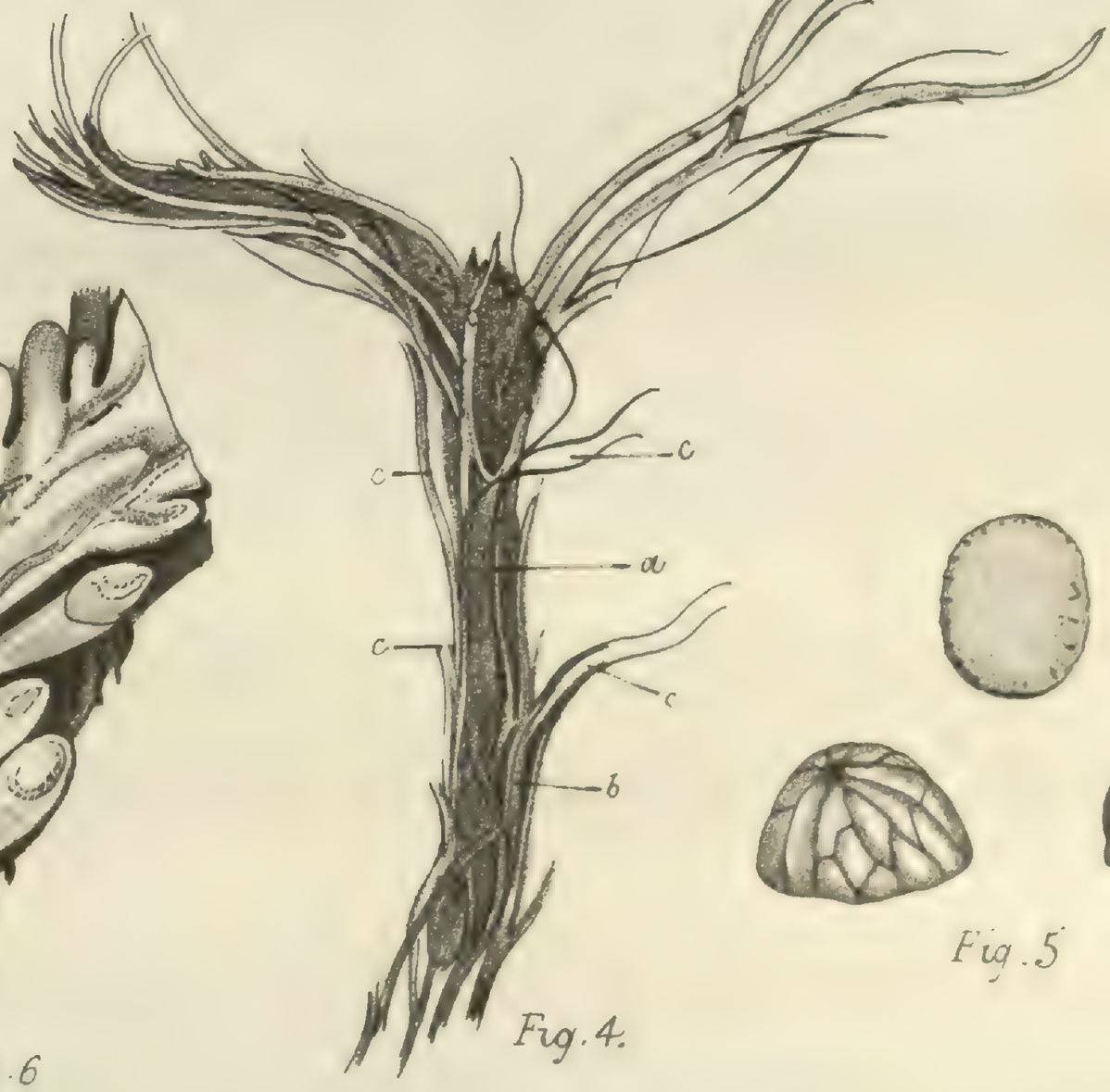


Fig. 4.

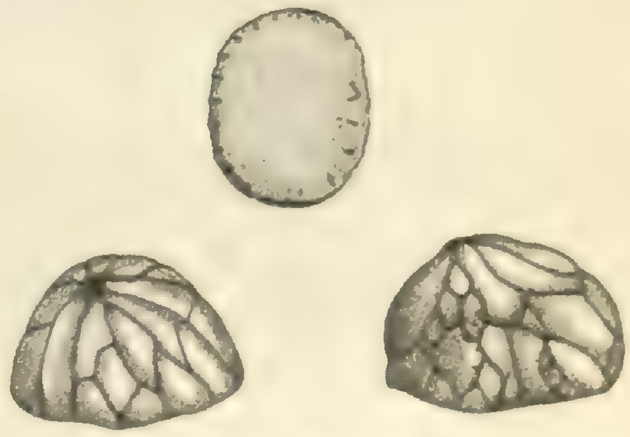


Fig. 5

W.H. Fitch. del. et lith.

J.N. Fitch imp

Fig 1-3. Alsophila latebrosa. *Hk.*
Fig 4. Polypodium proliferum *Presl.*
Fig 5 Nephrolepis cordifolia *Baker*

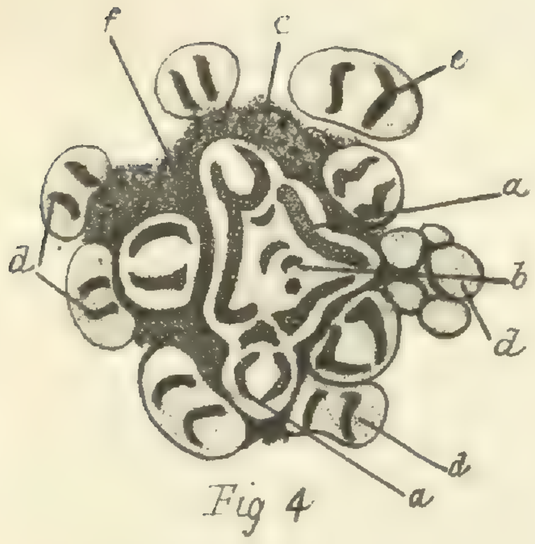


Fig 4

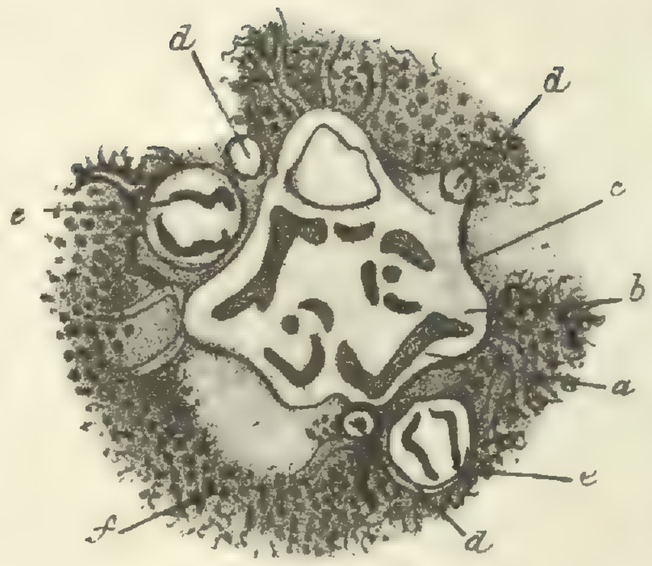


Fig. 3

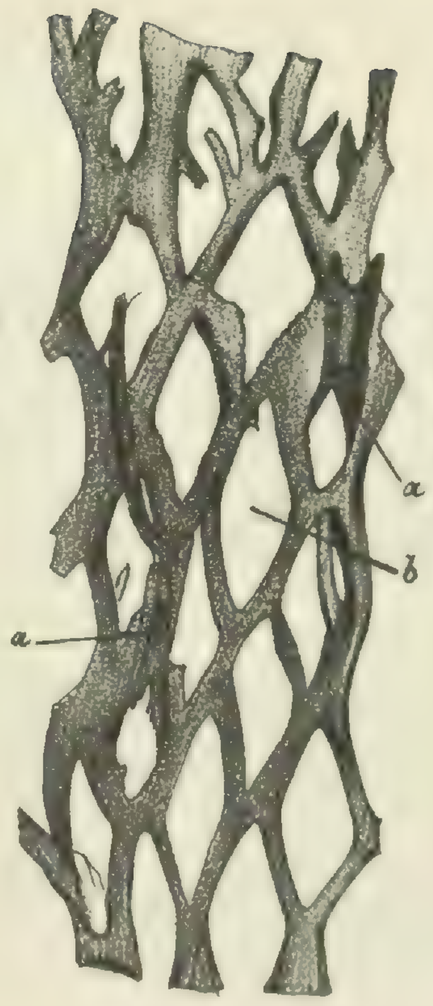


Fig. 2.

Fig 1

Fig. 6.

Fig. 5

Fig. 8

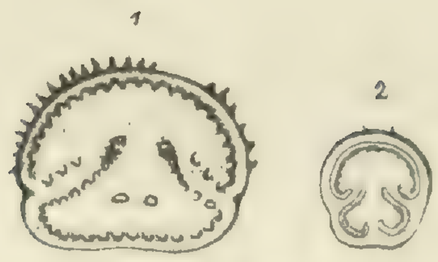


Fig. 7.

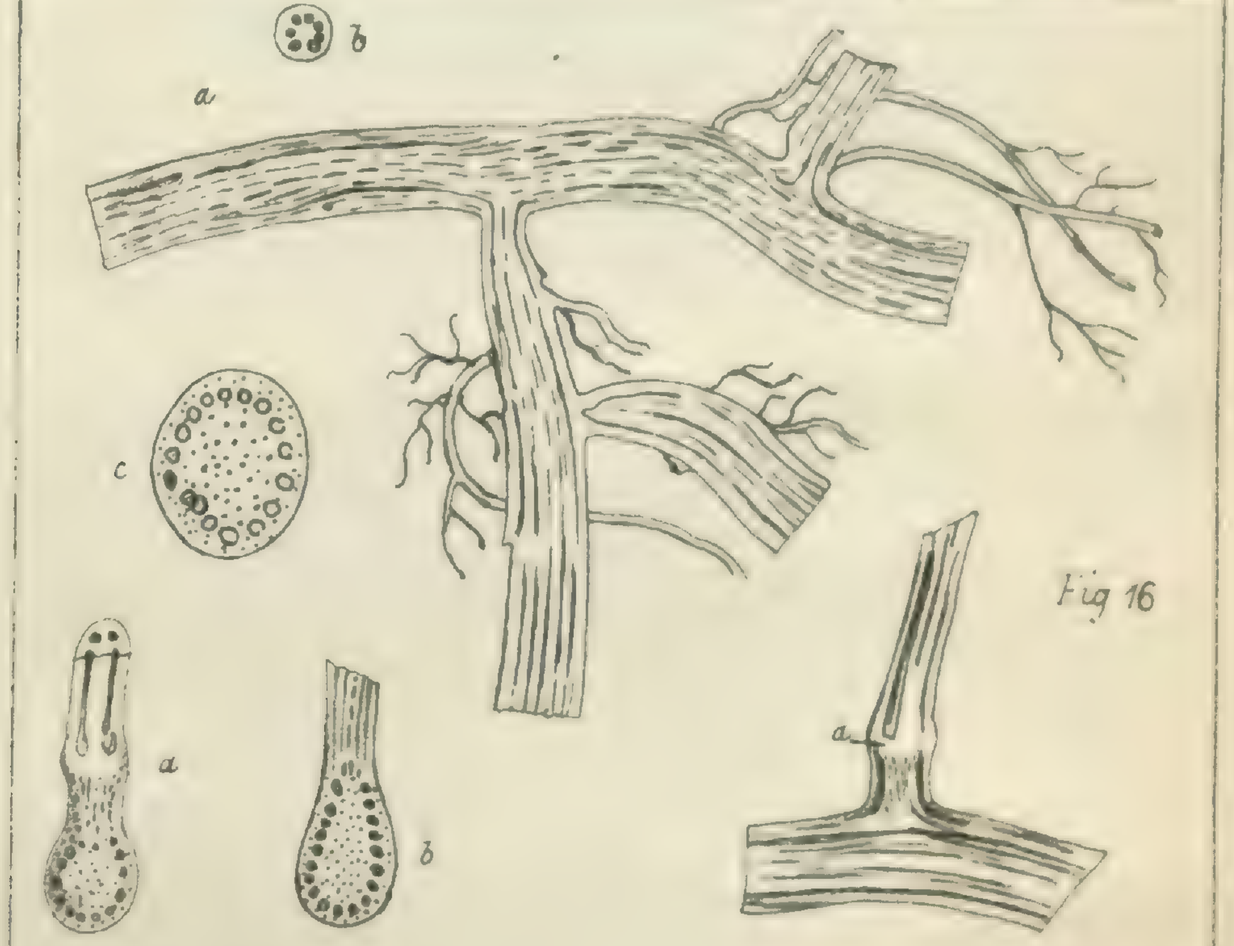


Fig 16

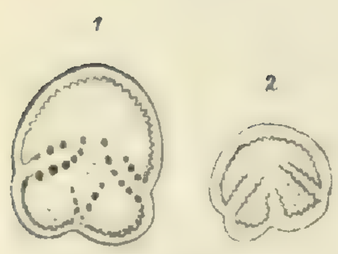


Fig. 10.

Fig. 9

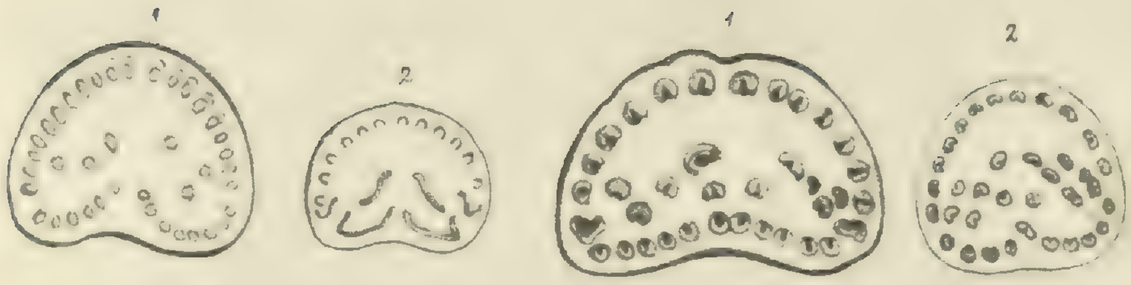


Fig 12

Fig. 11.

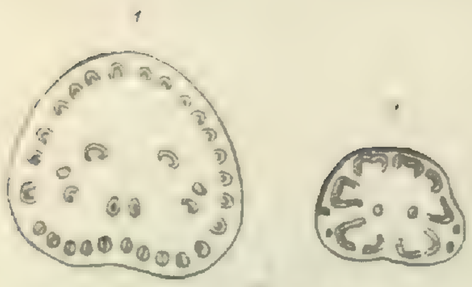


Fig 14

Fig. 13

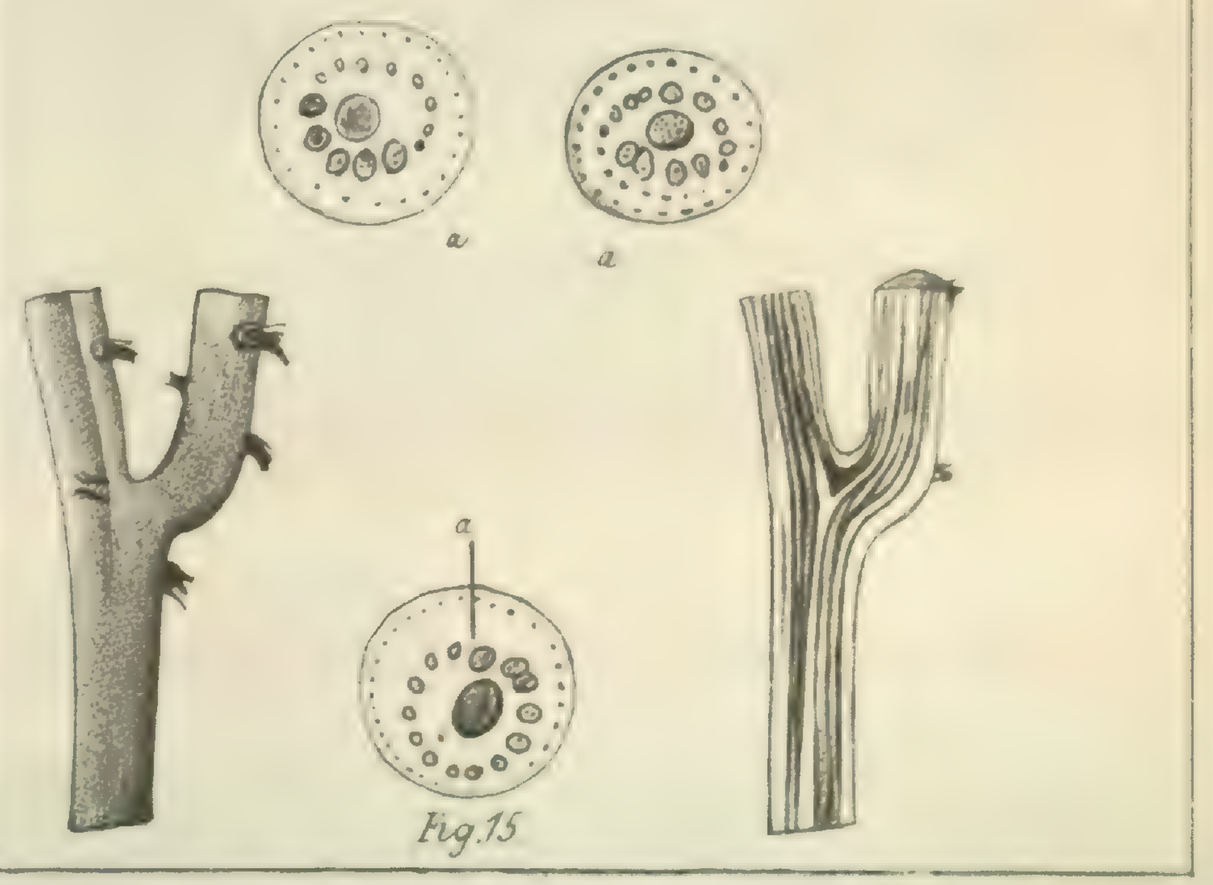


Fig.15

W.H. Fitch. del. et lith.

J.N Fitch. imp

Figs 1–6 Asplenium esculentum. *Presl*
9 Alsophila latebrosa. *Hk.*
11. Alsophila ornata. *Scott.*
14. Alsophila glabra, *Hk.*
15. Acrostichum scandens. *Fée.*

Figs. 7. 8. Cyathea spinulosa. *Wall.*
10. Alsophila contaminans *Wall var Brunoniana.*
12. Alsophila comosa, *Hk.*
13 Alsophila Andersoni. *Salt*
16 Polypodium phymatodes. *L.*

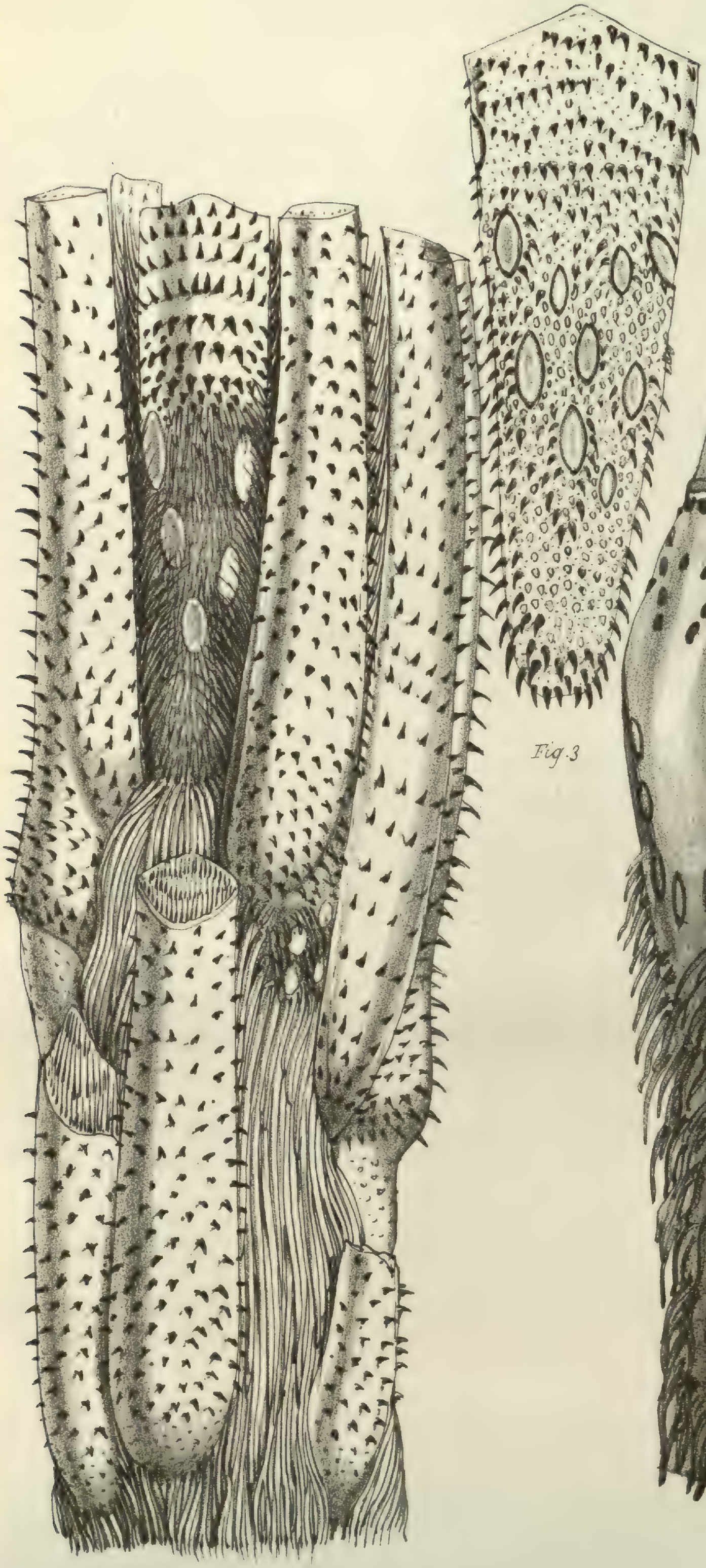


Fig. 2

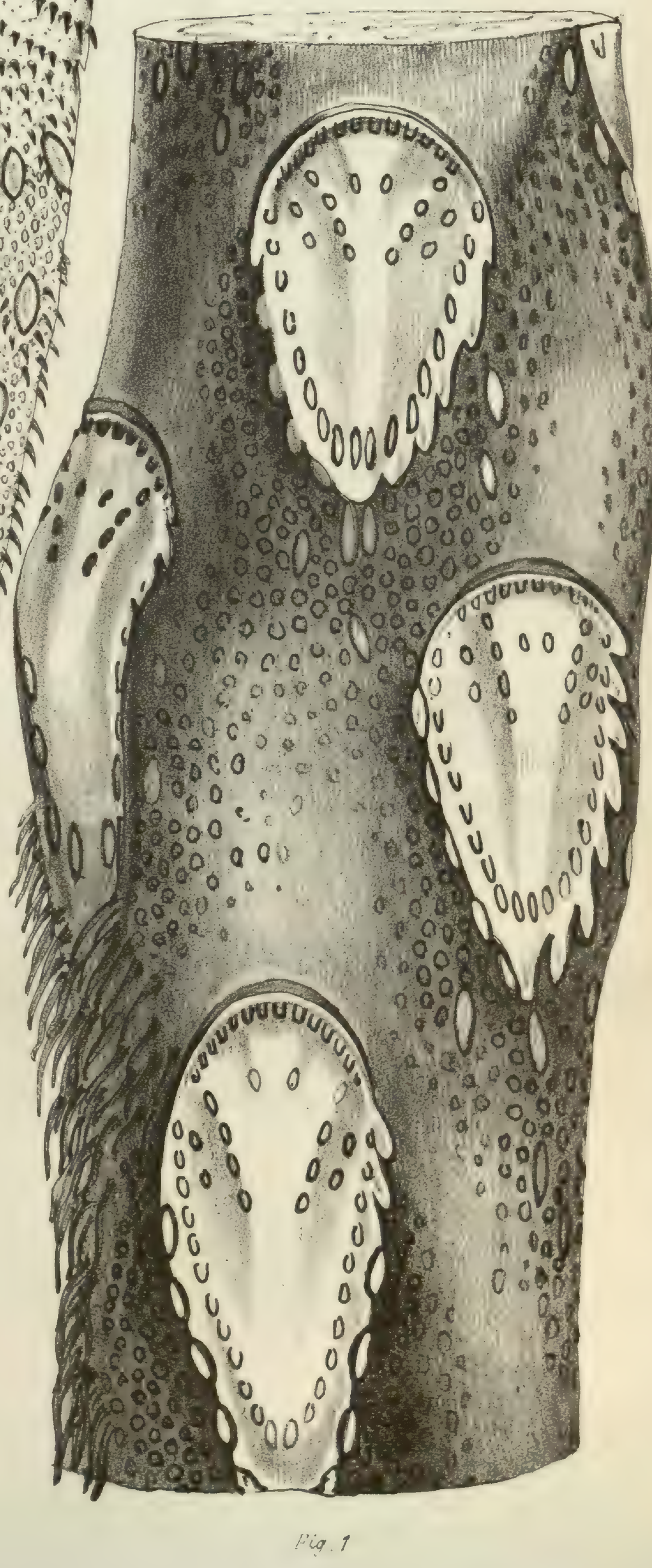


Fig. 1

Fig. 3

W.H. Fitch del. et lith.

J.N. Fitch, imp

Fig. 1. Cyathea spinulosa. *Wall*
Fig 2. Hemitelia decipiens. *Scott.*

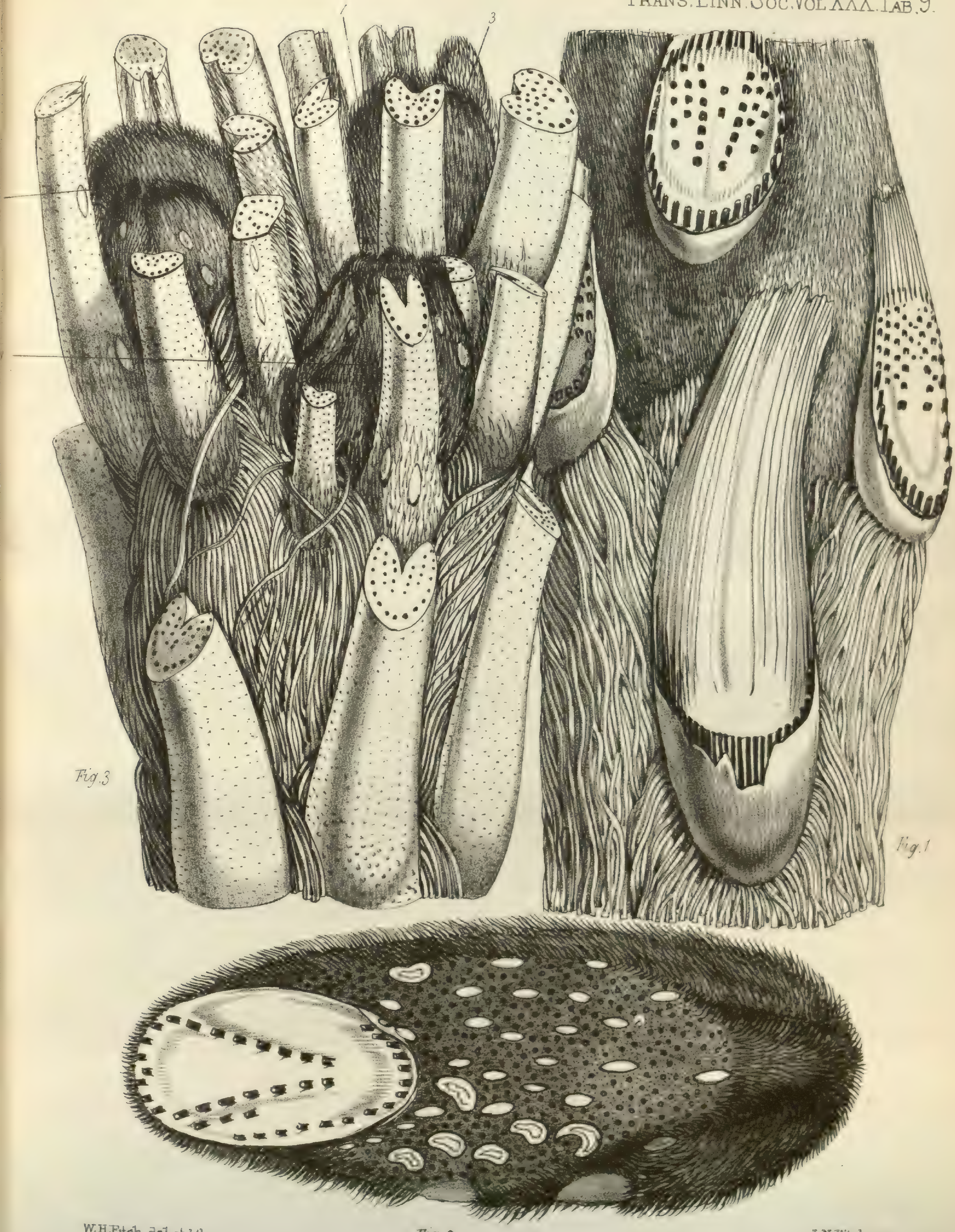


Fig. 3

Fig. 1

W. H. Fitch. del. et lith.

Fig. 2.

J. N. Fitch, imp

Fig 1. Alsophila contaminans . *Wall. var. Brunoniana.*
Fig. 2. Alsophila ornata . *Scott.*

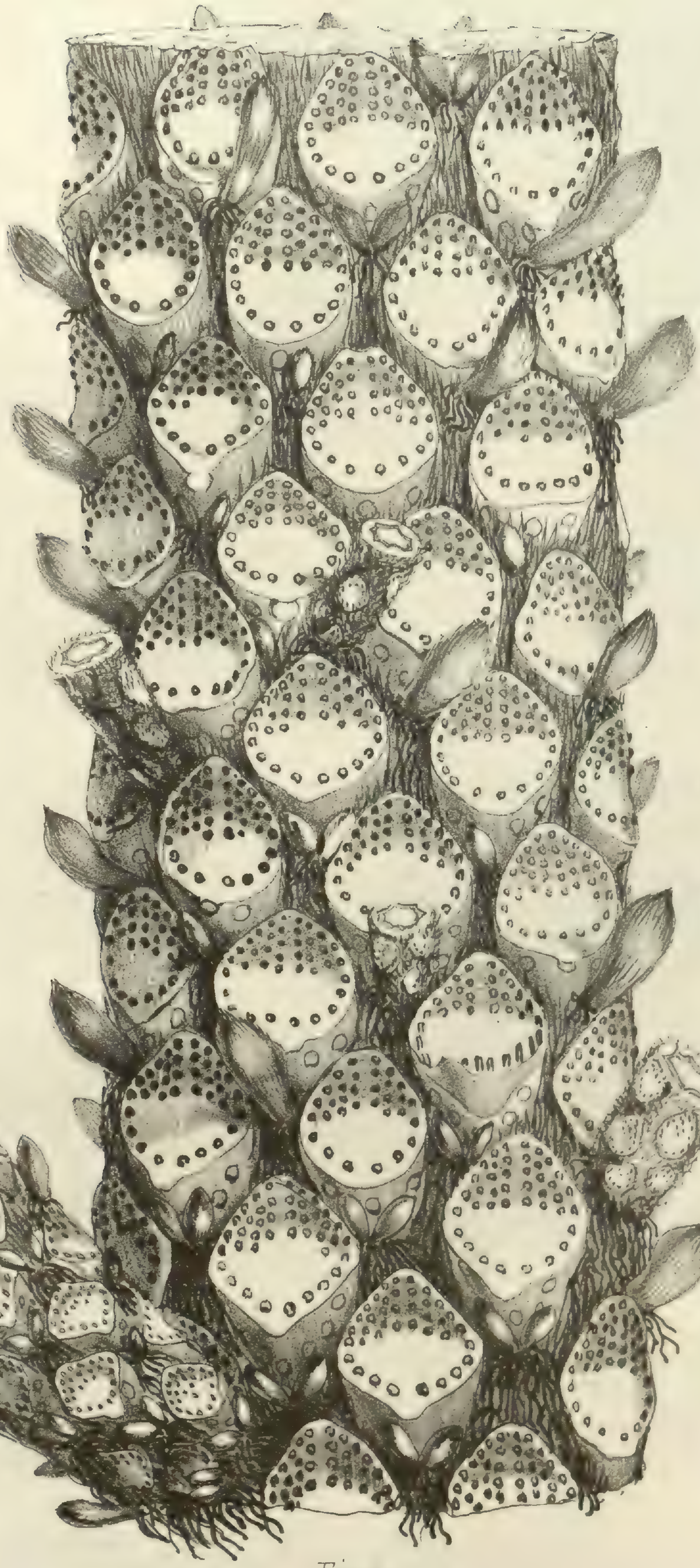


Fig. 1

Fig. 4

Fig. 2

Fig. 3

W. H. Fitch. del. et lith.

J. N. Fitch imp

Alsophila comosa, *Hk*.

Fig 1

Fig 2

Fig 4

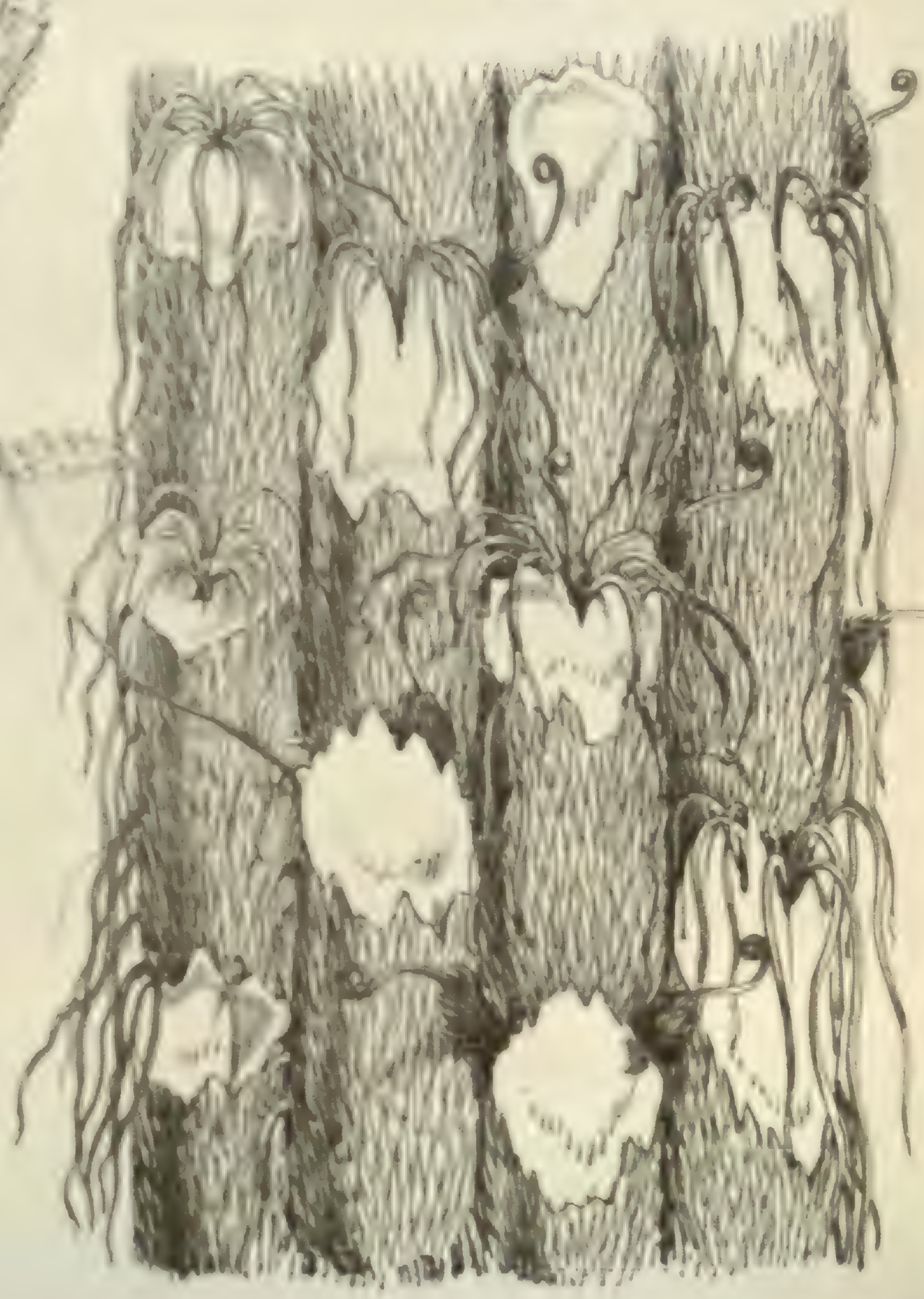
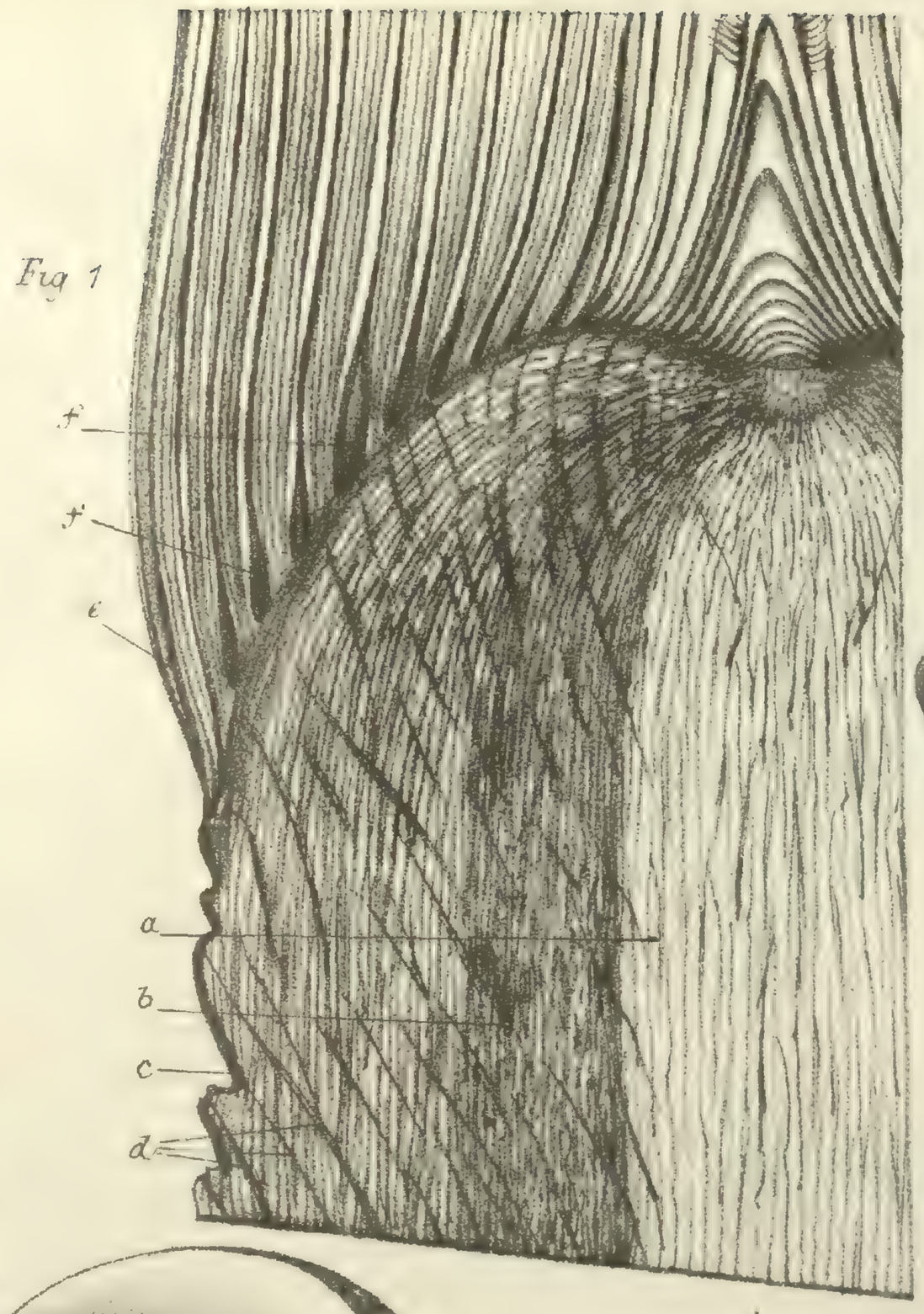


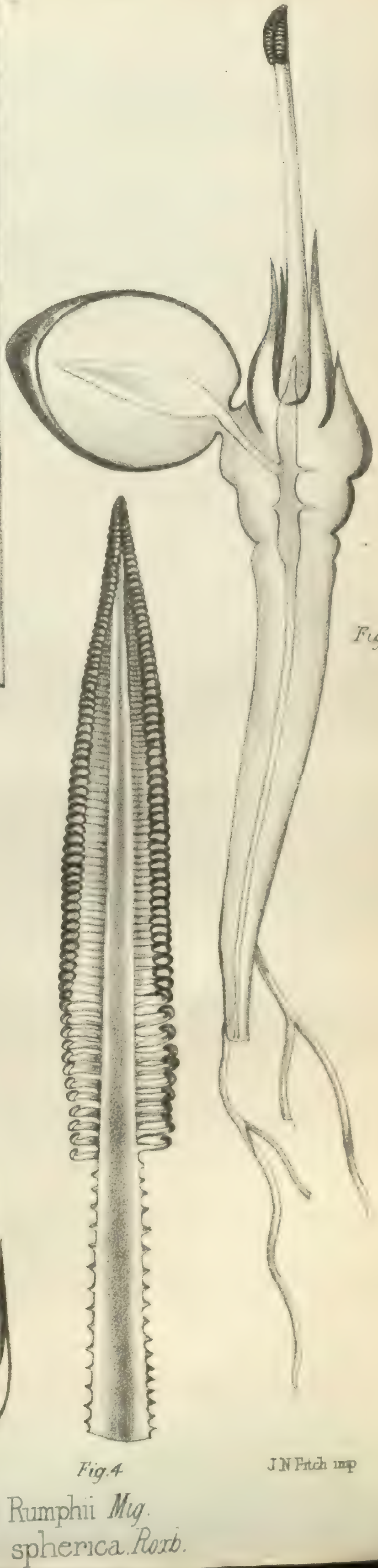
Fig 3

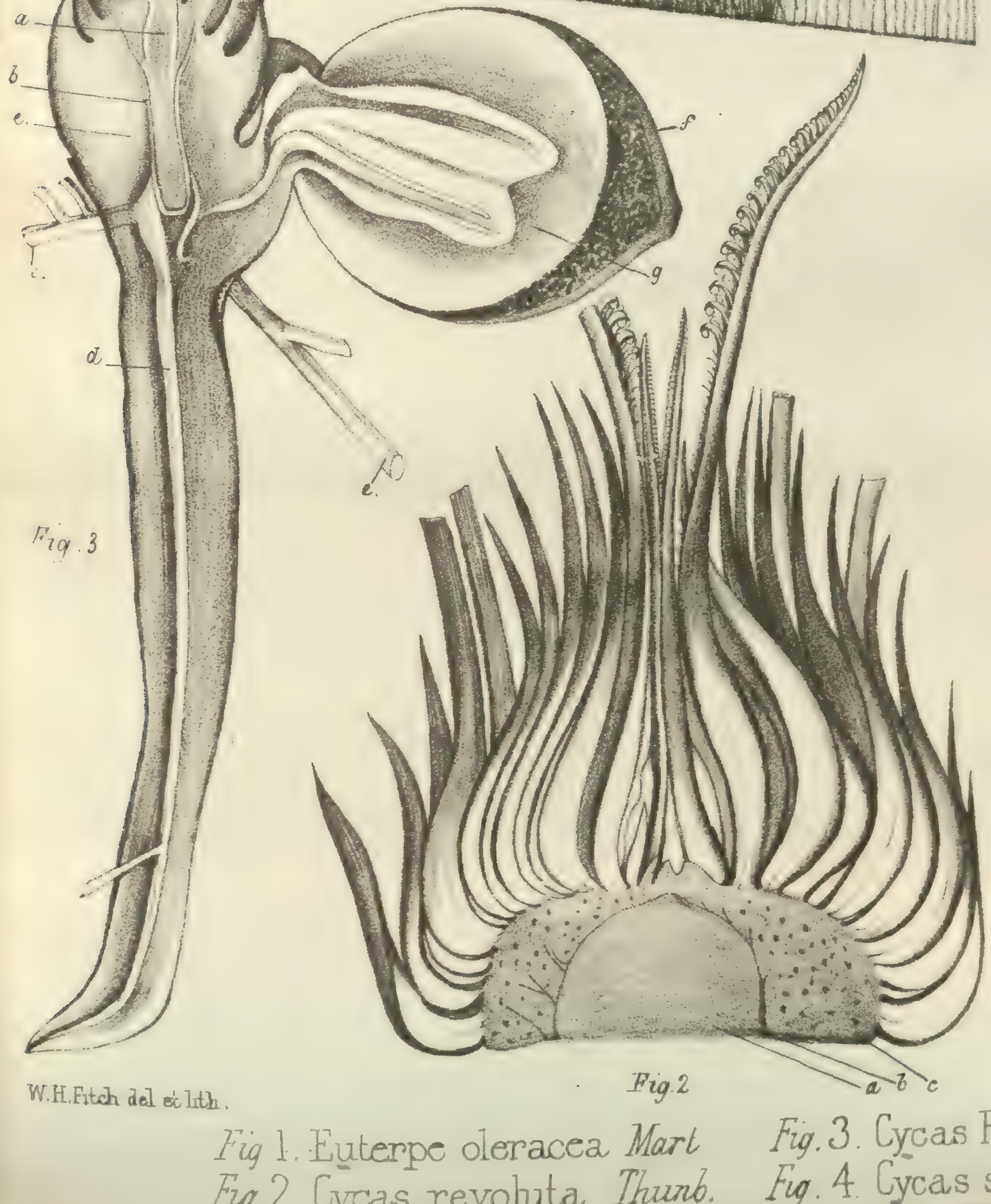
W H Fitch del et lith

J N Fitch imp

Figs 1 2 Alsophila Andersoni. *Scott*



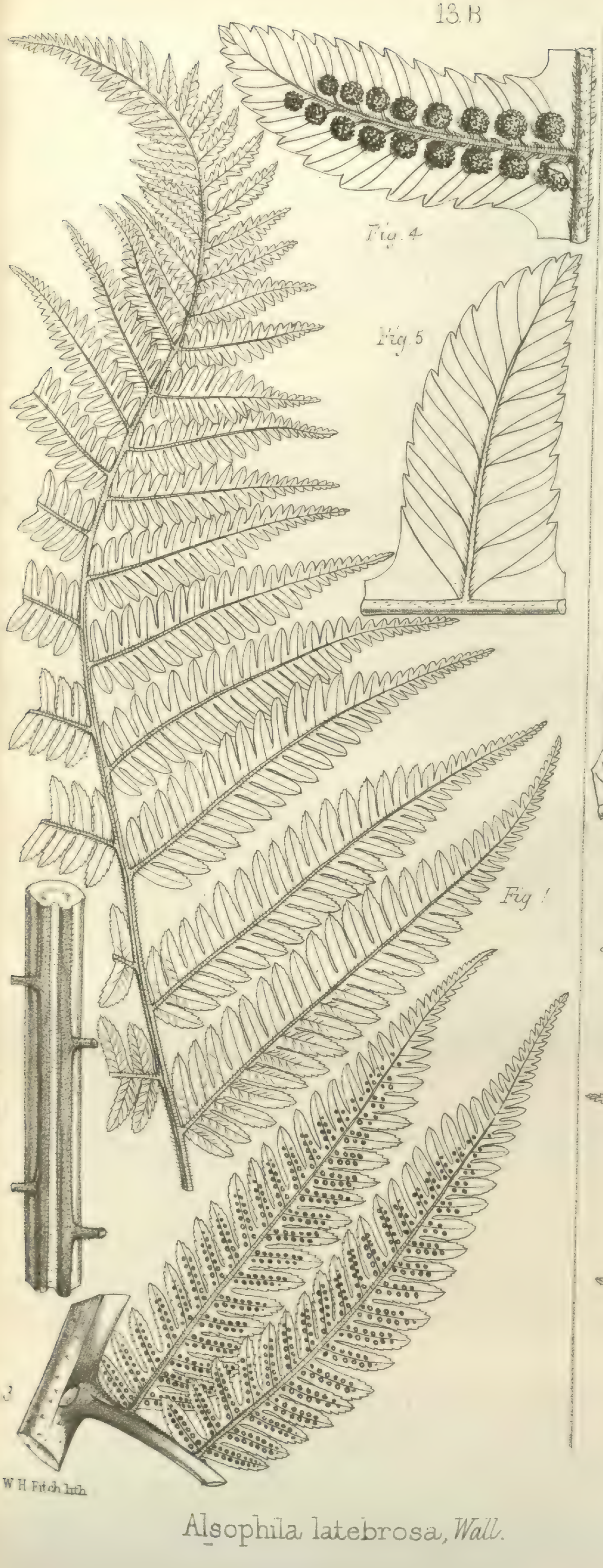




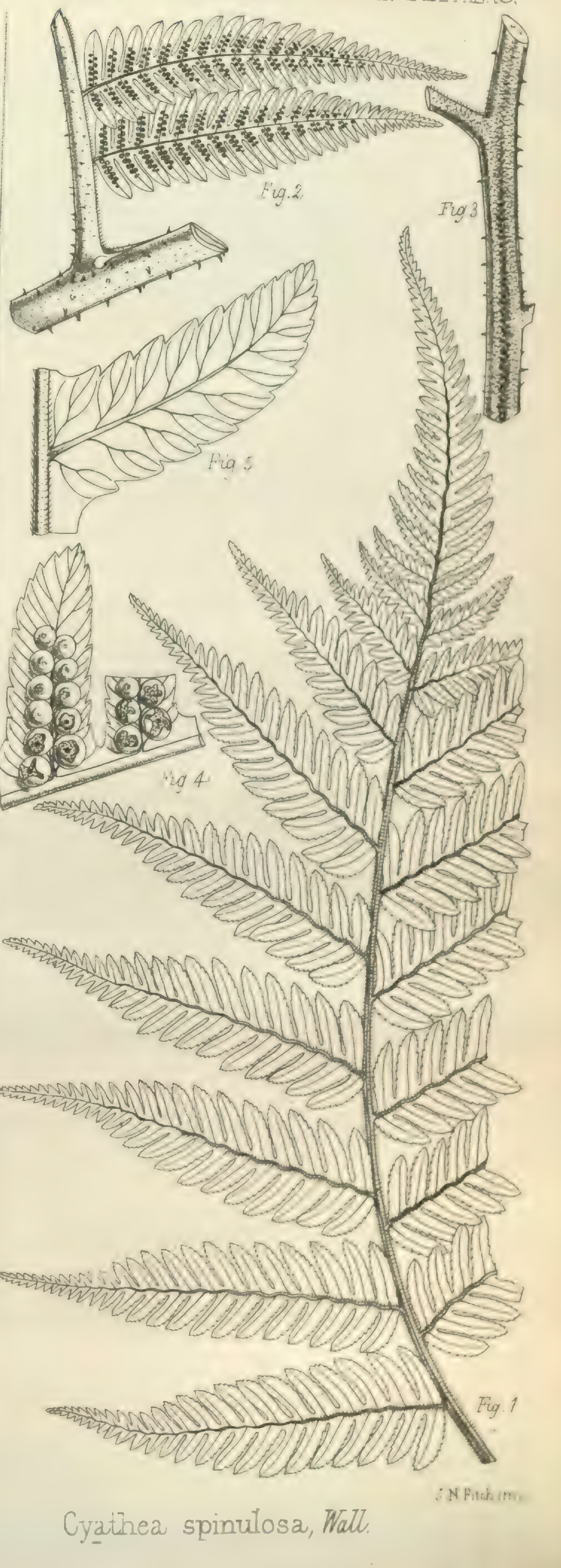
W.H. Fitch del et lith.

J N Fitch imp

Fig 1. Euterpe oleracea *Mart*
Fig. 2. Cycas revoluta *Thunb.*
Fig. 3. Cycas Rumphii *Mig.*
Fig. 4. Cycas spherica. *Roxb.*



Alsophila latebrosa, *Wall.*



Cyathea spinulosa, *Wall.*

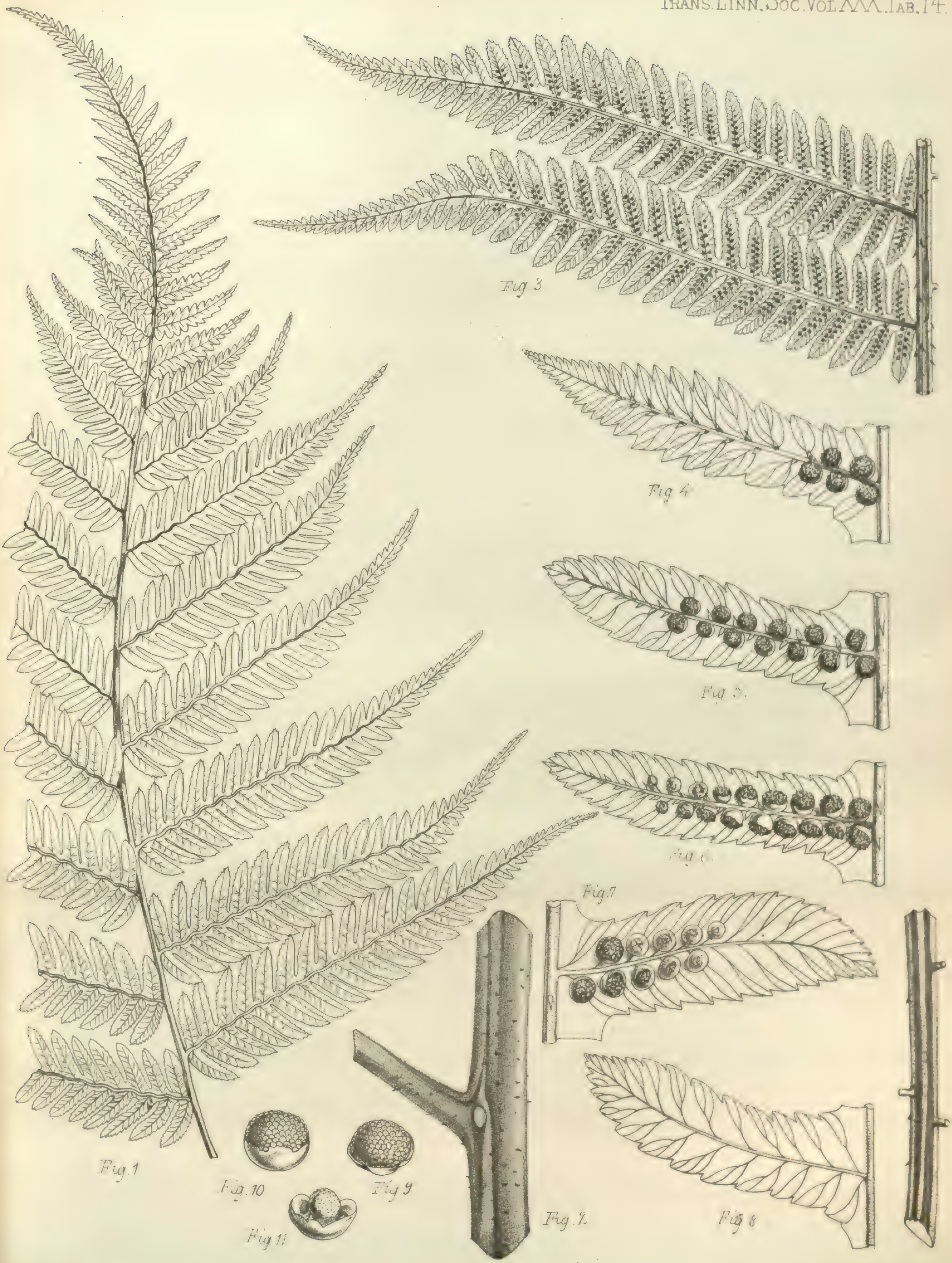


Fig. 1

Fig. 2

Fig. 3

Fig 4

Fig 5.

Fig 6.

Fig 7

Fig 8

Fig 9

Fig 10

Fig 11

W.H.Fitch del et lith

J.N.Fitch imp.

Hemetelia decipiens *Scott*.

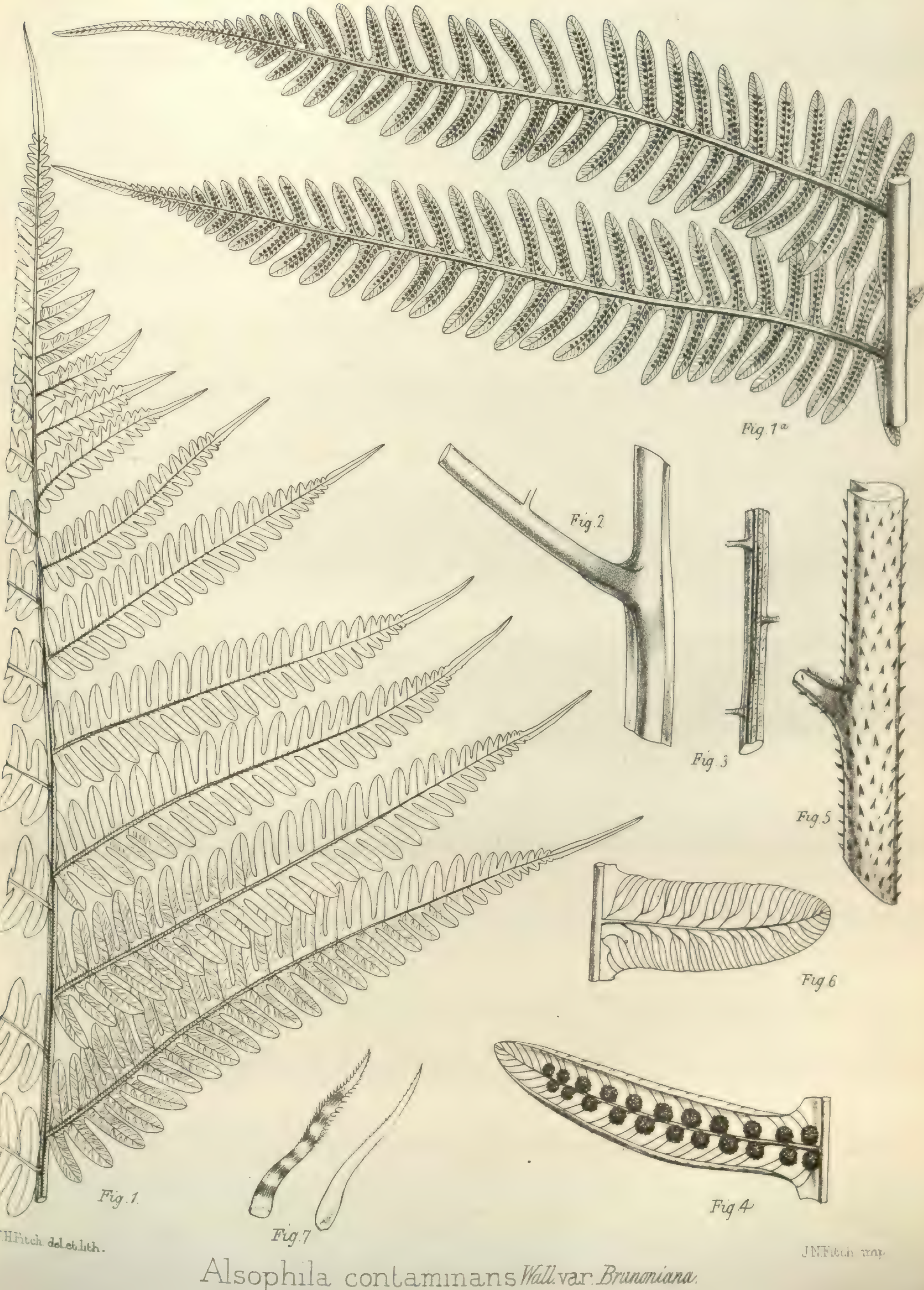


Fig. 1.

Fig. 1a

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

W.H.Fitch del.et.lith.

J.N.Fitch imp.

Alsophila contaminans *Wall.* var. *Brunoniana.*

16. B

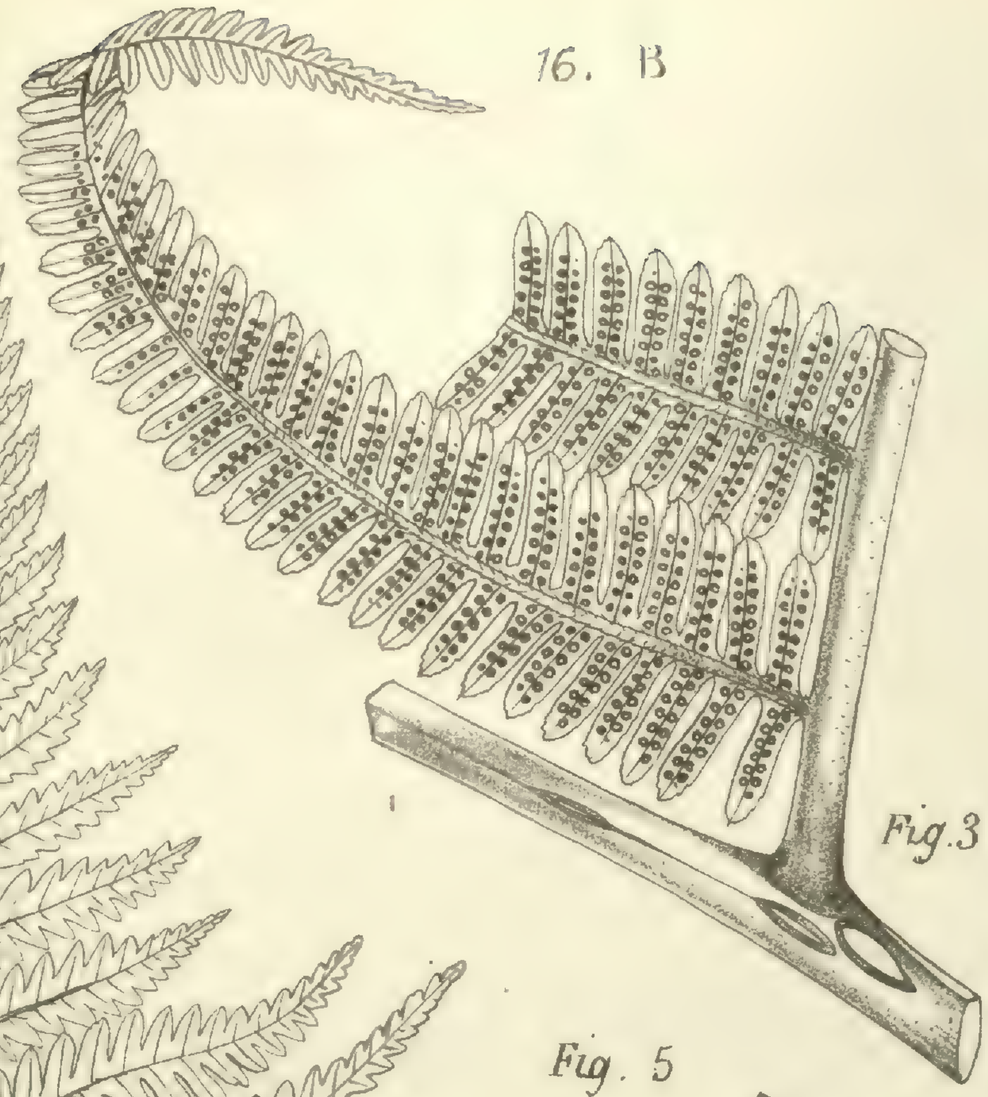


Fig. 3

Fig. 5

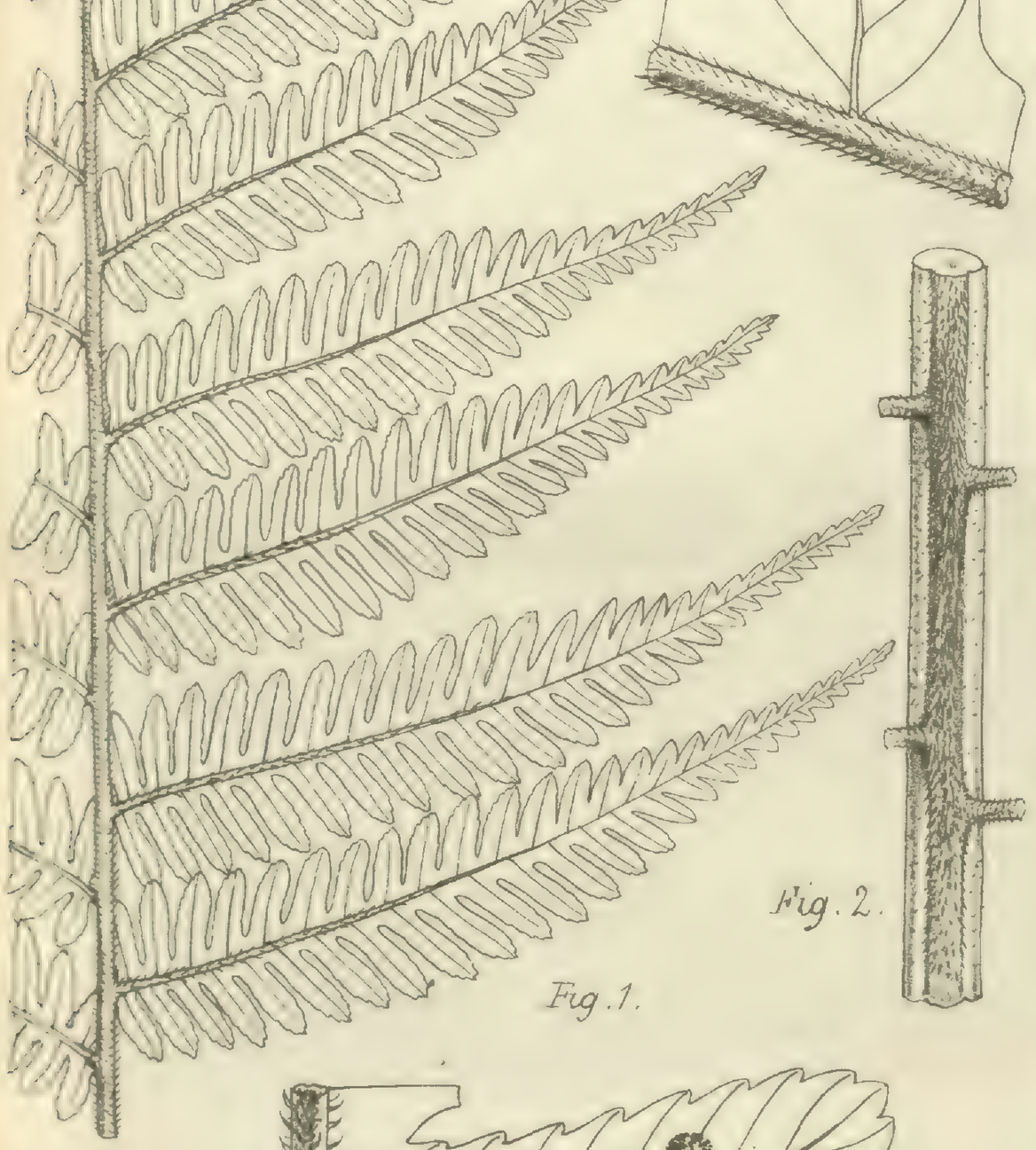


Fig. 2.

Fig. 1.

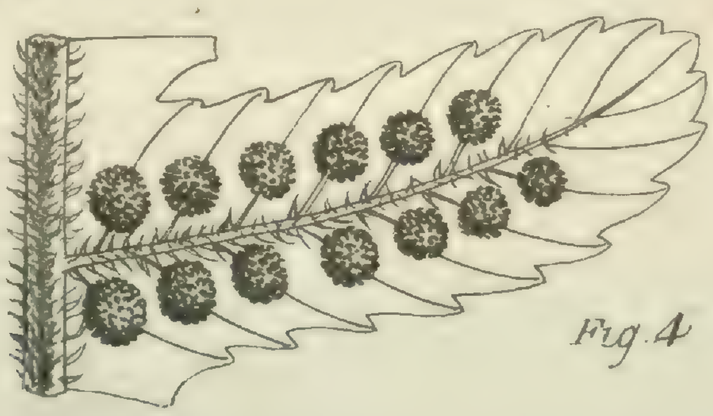


Fig. 4

W H Fitch lith.

Alsophila comosa, *Wall.*

16. A

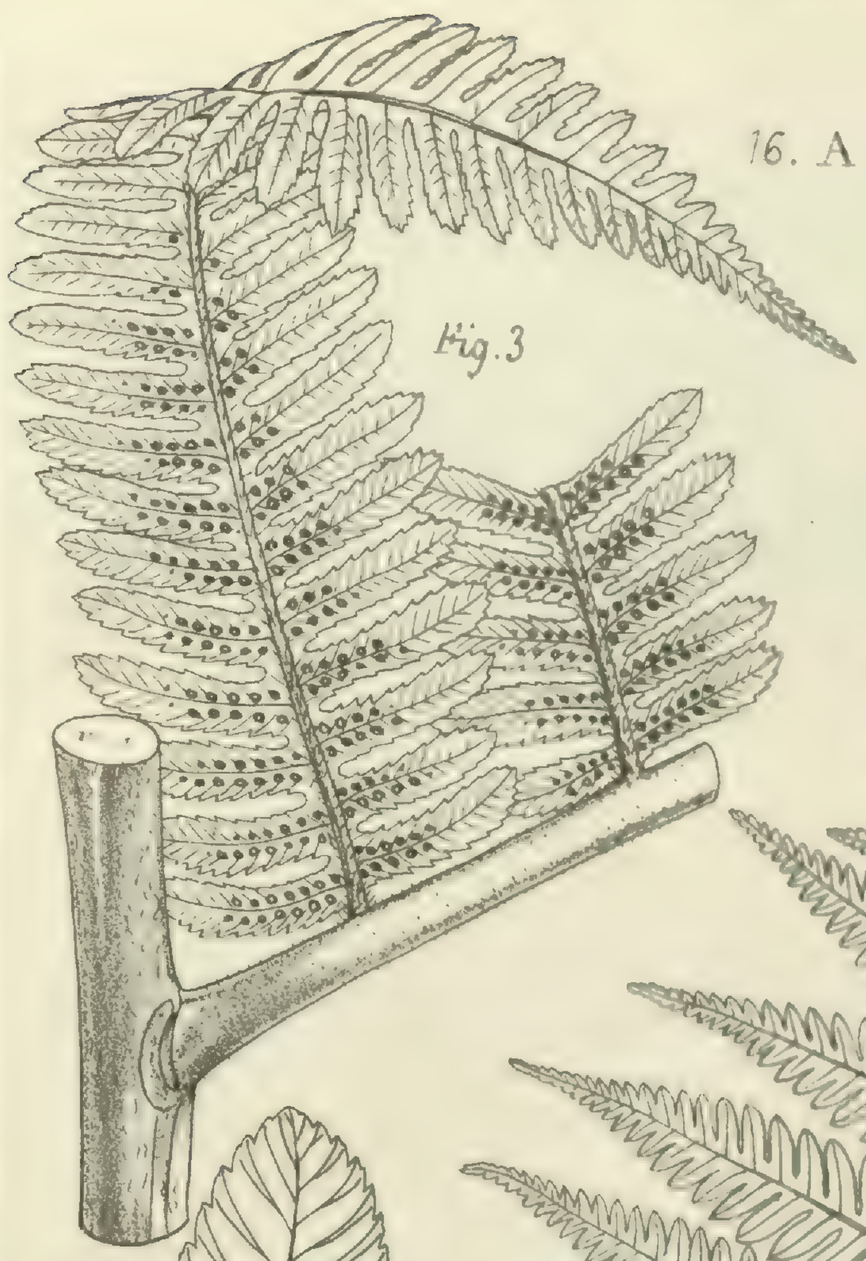


Fig. 3

Fig. 5

Fig. 2.

Fig. 1.

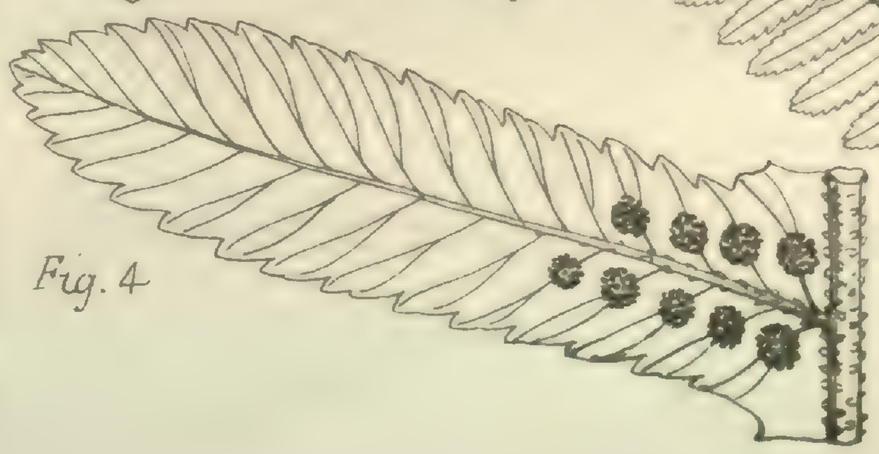


Fig. 4

J N. Fitch imp

Alsophila ornata, *Scott.*

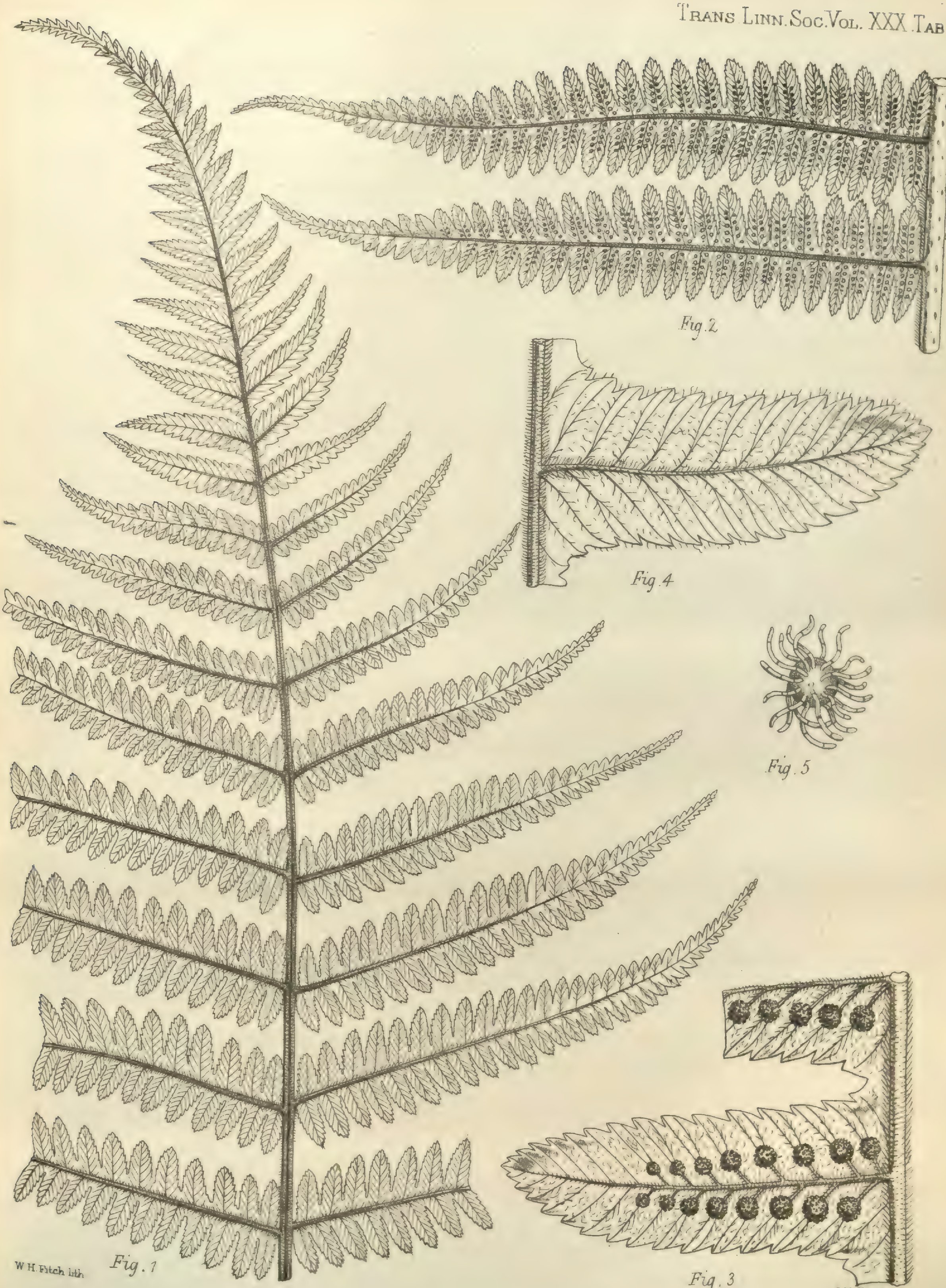


Fig. 2

Fig. 4

Fig. 5

Fig. 1

Fig. 3

W H. Fitch lith

J.N. Fitch imp.

Alsophila Andersoni, *Scott.*

W.H.Fitch. del. et lith.

J.N.Fitch. imp.

Alsophila glabra Hk

II.—*On some Recent forms of* Lagenæ *from Deep-sea Soundings in the Java Seas.* *By* F. W. Owen Rymer Jones. (*Communicated by* H. T. Stainton, *Esq.*, *Sec. L. Soc.*)

(Plate XIX.)

Read June 6, 1872.

Having devoted my time for some months past to the investigation of some packets of mud from deep-sea soundings in the Java seas, which were kindly transmitted to my father by Lieutenant A. Ross, one of the officers on board H.M.S. 'Serpent,' sent out on a surveying expedition in the latter part of 1868, I propose giving the results of my labours in a series of papers treating of the Foraminifera therein contained, beginning with the simple monothalamous group *Lagena*, many varieties of which, I believe, have not hitherto been figured. Though much valuable information regarding the minute organisms of the Foraminifera has of late years been brought to light, yet their distribution is so extensive both in a fossil and in a recent state, and they play so important a part in the economy of our earth, that our knowledge of them, even morphologically speaking, is still very incomplete. From the pole to the equator and from the equator to the pole, in littoral deposits and through every varying grade to the abyssal depths of ocean, these microscopic atoms teem in incalculable myriads, steadily increasing in numbers, and silently but surely forming, with the accumulated shells of ages, one of the most, if not *the* most, important of the potent agents in the remodelling of the surface of the earth.

The sounding (No. 2) from which all the forms figured in this paper were drawn, was brought up from a depth of about a mile and a quarter (1080 fathoms), ten miles south of Sandalwood Island (lat. 8° 30′ S. long. 115° 10′ E.), October 13th, 1868; and when brought up to the surface, the mud "had a greenish look and was very soft, with a consistency of jelly. Its temperature was 47° F.; and when the hand was applied it felt like ice." When I received the packet, it had the appearance of a thick cake of dry light-grey mud *.

Amongst the forms which are most powerfully represented, both as regards number and size, those of the Rotaline series seem to claim the precedence. *Rotalia* is abundant, and occasionally attains a good size (comparatively speaking; for all the forms from this sounding, with very few exceptions, are extremely minute). *Discorbina* and *Planorbulina* are abundant, but smaller. The *Uvigerinæ* and *Buliminæ* are plentiful and well developed; but *Bolivina*, though well developed, is more rare. *Textularia* is abundant; and its uniserial variety, the *Bigenerina* of D'Orbigny, is occasionally met with; while *Cristellaria* is rather rare and feeble. *Nodosaria* is well developed but not very abundant, as also is its Dentaline variety, though the latter is still more scarce. *Globigerina* is common. *Nummulina* is rather rare; but its variety *Operculina ammonoides*, Gron., is more abundant. *Cornuspira* is present, though moderately rare; and

* *Vide* note on page 69.

the *Miliolæ* *, including *Biloculina*, *Quinqueloculina*, *Triloculina*, and other varieties, are not uncommon. In this sounding I have also met with a few very perfect Rotaline "casts," probably of *Operculina*.

The *Polycystinæ* are also abundantly represented by many very beautiful forms, some of which I believe are new to science.

The *Diatomaceæ*, too, are very numerous, and are well represented by *Coscinodiscus*, *Campylodiscus clypeus*, *Amphitetras ornata*, *Asteromphalus elegans*, *Cerataulus turgidus*, and *Triceratium favus*, Ehr., the last of which is rather rare, though the quadrilateral form of this species is very common.

The "tests" of Foraminifera are plentifully met with, and present great variety of shape and texture, some being merely an agglomeration of irregular coarse sand grains; while others are composed of smooth, straight sponge-spicules, sometimes loosely interwoven, or compactly and longitudinally arranged; and those of a third variety are formed by a very translucent exudation from the contained living body, which is strengthened in parts or all over by small sponge-spicules, sand grains, and minute shells of *Rotalia*.

The valves of *Ostracoda* appear in considerable abundance; amongst which are those of *Cythere clathrata*, Reuss, *Bairdia amygdaloides*, *Cytherideis maculata*, *Cythereis lacerata*, *Heterodesmus Adamsii*, Brady, and many other varieties.

The spicules of Sponges which are met with so profusely in the "Spongitenkalk" of Germany, and in the Upper Greensand and Oolitic and Carboniferous Limestones of our own country, are also abundantly present in these seas, and form an important item in the sedimentary deposits of the present deep-sea bed. Their forms are very varied and beautiful, presenting so many diversities of shape that the study of these alone is full of interest.

The spines of *Echini* also are not by any means uncommon, many of them being very elaborate and perfect.

The *Lagenæ*, which are now under consideration, are tolerably abundant and well developed in this sounding, though as a rule they are very small. The largest forms I have met with measure about $\frac{1}{30}$ of an inch long by $\frac{1}{70}$ of an inch wide, the smallest here figured scarcely attaining $\frac{1}{350}$ of an inch in length by $\frac{1}{630}$ of an inch in width, though I have met with perfect Entosolenian forms (those provided with an internal tube) so minute that their shells measured no more than $\frac{1}{500}$ of an inch long by $\frac{1}{1250}$ of an inch broad. Making, therefore, a rough calculation, and allowing for no compression of the shell-walls, which a great majority of them undoubtedly possess, a cubic inch would contain upwards of a million and a quarter of these microscopic forms. The *calcaire grossier* of the Paris basin is estimated to contain about 58,000 in a cubic inch; and D'Orbigny estimated the number of these minute organisms in the same quantity of sand from the Antilles at upwards of $3\frac{3}{4}$ millions. Such an array of figures even for one cubic inch of this mud passes far beyond our

* This group appears to have its representatives in the porcellaneous, arenaceous, and vitreous series, as it is by no means uncommon to meet with young specimens the shell-walls of which are as transparent as glass.

appreciation; but when we consider that this is repeated throughout the whole length and breadth of ocean, we may indeed fling arithmetic to the winds.

There is, perhaps, no family of the Foraminifera which presents such a varied and rich collection of forms of such marvellous delicacy and exquisite beauty of contour as the Lagenidæ; and yet withal, they present a simplicity of structure and decoration as beautiful as it is simple. Flasks, amphoræ, goblets, water-carafes, and flagons all have their representatives among this mimic throng; yet all are so delicately sculptured, and present so great a variety of shape and surface-decoration, that it would be difficult to find a more perfect type of grace and elegance than some of these microscopic forms possess.

The wider a survey one takes of the Foraminifera the more closely do forms which, taken separately, are entirely differentiated as regards shape, approach each other through so many intermediate gradations, that it becomes far from easy to define the proper limits of each family; and it is this which makes a natural classification of them so difficult of attainment. Nor are the *Lagenæ* exceptions to this variability; for though, as a rule, there is throughout a general family likeness, yet they differ so greatly, both as regards shape and external decoration, that it becomes extremely difficult to define with precision any peculiar characteristics of sufficient limitation and unvarying combination to separate them from each other even specifically.

With regard to the isomorphisms of *Lagena* they are by no means uncommon. With *Nodosaria Lagena* blends so imperceptibly that it becomes a matter of uncertainty to which group some of these forms belong, while some of the "wild" growths bear a degree of resemblance to *Polymorphina*. I have in my cabinet a two-chambered form, occupying the neutral ground between the two-chambered *Lagenæ* and *Nodosariæ*, which takes a decided Dentaline curve, the elongated necks being excentric, though the septal line is very constricted, and thus preserves the true Nodosarine character. Among the *Miliolæ* this isomorphism is very remarkable, one porcellaneous form being monothalamous, and having the shape of a subglobular neckless flask, the exterior of which is ornamented with three small longitudinal riblets on either side. Another has the form of a very narrow elongated flask with a well-formed external neck, the older chambers being enclosed within the flask and lying close to one of the sides. A somewhat similar occurrence is observable in some of the arenaceous varieties of *Miliola*, where the last chamber becomes greatly enlarged, and encloses the smaller ones within its walls.

These points of similarity, however, are of no importance, as these shells in other respects differ so materially that they are widely separated.

The shell-walls of the *Lagenæ* are usually perforated with pseudopodial orifices, though this characteristic is subject to great variation. In some shells these canal-pores appear to be entirely wanting, the walls being beautifully smooth and of glassy transparency; while in others, such as *L. lævis*, Montagu, figured by Messrs. Parker and Rupert Jones (Foram. from the N. Atlantic and Arctic Oceans, p. 349, pl. xiii. fig. 22), the foramina occupy only the lower third of the shell. Sometimes, as in *L. marginata*, Montagu, (Pl. XIX. fig. 28), they are clustered round the margin of the shell in a wide horseshoe-like band. A somewhat similar example from the Hunde Islands, is figured by Messrs. Parker and Rupert Jones (*loc. cit.* pl. xiii. fig. 44). In one shell (*L. marginata*) these

pseudopodial orifices are irregularly dispersed over the shell-surface, but leave a small irregular patch near the middle of each side, smooth and imperforate; while in others the tubuli take an oblique direction, radiating from the centre (*L. radiato-marginata*, Parker and Rupert Jones, fig. 33).

This peculiarity is seen in greatest perfection in their recent form from the Australian coral-reefs (*loc. cit.* pl. xviii. fig. 5 *a*). Some of the two-chambered varieties, however, present both the oblique and straight style of foramination in the same shell, the primordial chamber sometimes having them radiated, while in the second chamber they pass directly from without to the interior (figs. 60, 62). In some of the costate *Lagenæ*, such as the *L. striato-punctata* of Parker and Rupert Jones, the pseudopodial passages are said to be confined to the base of each riblet, at either side of which they form a single row of punctations.

Not unfrequently these flask-like forms are provided with an internal tube, which, however, is not seldom absent. When present, it shows great variability, sometimes passing in a straight line to the bottom of the cavity, where it terminates (fig. 36), or even bends round at right angles and runs along the bottom for a short distance; or, on the other hand, the tube is cut short at any intermediate point between the orifice and the base. In others it becomes greatly flexed, taking a more or less serpentine form, or is sickle-shaped (fig. 1), while occasionally it takes a sigmoid curve, or even curls round at the top like a pig's tail. The mode in which the tube terminates is also variable. In some it ends abruptly, without any apparent increase in diameter towards the end; while in others the free end becomes patulous or trumpet-shaped, and in a few cases it widens out like the bottom of a sailor's trouser-leg.

This internal tube is not, however, peculiar to the *Lagenæ*, though its appearance is most commonly observable among these shells. A similar tube is also present in some of the *Polymorphinæ* and in the ultimate segment of forms of *Dentalina legumen*, D'Orb., of which I possess more than one example; in some of these shells the anterior chamber is also produced into a long slender external neck. Among some members of the *Nodosariæ* the internal tube is also well developed, as I have before me a three-chambered, striated, and marginate form, each chamber of which is provided with a well-formed internal stolon-tube.

In the following pages I have endeavoured, as far as possible, to follow the nomenclature proposed by Messrs. Parker and Rupert Jones, and set forth in Dr. Carpenter's 'Introduction to the Study of the Foraminifera.' I have, however, reverted to the typical name *vulgaris* of Prof. Williamson (Monograph 'On the Recent Foraminifera of Great Britain' (Ray Soc.) 1858, p. 4) in preference to that of *sulcata* of Walker and Jacob, from the fact that not only would the employment of such terms as *L. sulcata*, var. *lævis*, be decidedly contradictory, as Prof. Williamson has pointed out, but, when such combinations as *L. sulcata*, var. *globosa*, are made use of, it would create on the mind a wrong impression of the organism; for it would infer that the shell is ribbed, whereas it is smooth. The substitution of the name *vulgaris* obviates all this.

With regard to specific names, the shells of this group pass so imperceptibly by so many gradations into each other, that structures the most dissimilar are found to be closely

connected by intermediate links, and can therefore be regarded only as varieties of one specific form, as Messrs. Parker and Rupert Jones have already observed. Many of the shells here delineated, which have not, to my knowledge, been hitherto drawn, present many features of interest to the students of these Microzoa. These I have for the most part arranged as subvarieties of forms already named; and I have endeavoured, as far as expedient, to add as few new names as possible to the already too perplexing medley of synonyms.

I do not expect the following pages to be exempt from those faults which are so apt to creep in when studying such minute forms as those here described; but as all these shells have been drawn and studied by me while in a recumbent position on an invalid's couch, I trust that all defects will meet with a lenient criticism. Shut out in a great measure, as I unavoidably have been, from access to many of the works of reference, and unable to retain the few I succeeded in obtaining, except for a very short time, I have had to contend with many disadvantages; and therefore, if through these pages there are errors of synonymy or the like, those who have learnt from experience the difficulties which a person cut off from the advantages of our libraries, and never allowed to assume even a sitting posture from one year's end to another, has to contend with, will, I am sure, look with an indulgent eye on all minor shortcomings.

Those who are desirous of becoming more thoroughly acquainted with these and other Foraminifera cannot do better than to study Dr. Carpenter's 'Introduction to the study of the Foraminifera'*, and the monograph by Messrs. Parker and Rupert Jones on those of the N. Atlantic and Arctic Oceans †, and their several memoirs on the nomenclature of the Foraminifera ‡, and, for those of our own coasts, the excellent monograph by Prof. Williamson. The Paris basin and several recent deposits have been well explored by M. d'Orbigny; while the fossil forms from several foraminiferous deposits in Germany have been copiously figured and described by Prof. A. Reuss, who has furnished us with a series of pictures unsurpassed both as regards numbers and excellency of drawing, and one of whose memoirs is entirely devoted to the *Lagenæ* §.

To the valuable information thus accumulated I now append these forms from the abyssal depths of the Java seas, with the hope that they may help to extend our knowledge of these marvellous little beings, and awaken the curiosity of many to search for themselves among this uninteresting-looking "mud," which forthwith, touched as it were with a magician's wand,

> "Shall have a voice, and give them eloquent teachings."

LAGENA VULGARIS, Williamson, var. (*Entosolenia*) *globosa*, Montagu. (Figs. 1, 2.)

Shell free, symmetrical, of very variable shape, passing through every intermediate stage between a globular, ovoid, and cylindrical contour. External walls smooth.

* 'Introduction to the Study of the Foraminifera,' by W. B. Carpenter, M.D., F.R.S., assisted by W. K. Parker, Esq., F.R.S., and Prof. T. Rupert Jones, F.G.S. (Ray Soc. 4to, 1862).

† In 'Phil. Trans.' London, 1865, vol. clv. pt. i.

‡ Papers on the Nomenclature of the Foraminifera, in the 'Annals & Mag. of Nat. Hist.' 1859–1863.

§ "Monographie der Lagenideen," in Sitzungsber. der Acad. der Wissenschaften in Wien, Band 46, Abth. i. 1863.

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hyaline or semiopaque, very coarsely foraminated in some, while in others the canal-pores are very fine or entirely wanting; orifice central, circular, and more or less lipped; situated at the anterior extremity, and most commonly communicating with the interior by means of an internal, slender, straight or flexed tube of very variable length, sometimes ending abruptly or becoming patulous at the free end. The base of the shell is very variable, presenting in some a widely rounded form, which even becomes flat or dimpled in the centre, while in others it is furnished with a small mucro, or becomes very peaked, insensibly passing into the apiculate varieties figured by Prof. Reuss, and between which there seems to be no line of demarcation. The anterior portion of the shell is equally variable, in some being very bluntly rounded, while in others the reverse is the case.

Prof. Reuss figures a form under the name *L. emaciata*, the only difference being in its more slender and elongated shape; but this difference, together with that exhibited by the square variety, *L. inornata*, of D'Orbigny, passes by so many intermediate gradations into the egg-shaped and globular ones, that they cannot with propriety be separated.

The amount of variation among this species is very remarkable; and at first sight it seems difficult to regard them all as belonging to the same species; but like as the leaves of the oak or the ivy vary greatly even on the same tree, and yet present unmistakable points of resemblance between one and another, so among the shells of this group, though their contour is extremely variable, yet they present so great a family likeness, both as regards shell-structure and absence of ornamentation, that it would be wrong to separate them.

These forms are, as a rule, symmetrical; but in a few cases this uniformity of contour is impaired. These examples, however, are only adventitious.

Occasionally one meets with shells having a suture-like mark on their shell-wall—the shell having most probably been accidentally broken, and repaired by the contained foraminifer (fig. 2).

LAGENA VULGARIS, Williamson, var. *apiculata*, Reuss. (Figs. 3–5.)

The shells of this variety are in all respects similar to those of the *L.* (*Entosolenia*) *globosa*, saving that in these forms the base is more or less truncated or furnished with a mucro of very variable length. These varieties seem to form an intermediate link between the the *L. globosa*, and *L. lævis* on the one hand and the *L. distoma* on the other. Messrs. Parker and Rupert Jones unite under this name several forms, the base of which is provided with an aperture; but though such shells are undoubtedly very closely allied to the apiculate varieties, yet many forms occur in which this apiculation of the base assumes a more caudate character, and forms a solid and sometimes curved basal appendage; and therefore I am disposed to regard those with a true basal aperture as belonging to the distomatous series, and to admit, under the name *apiculata*, only those structures which, though produced at the base, are still imperforate. These shells, however, pass so gradually from those with a rounded base that I question the propriety of separating them from *L. globosa* and *L. lævis*, except for the sake of convenience.

Occasionally one meets with abnormal growths, many of which are very remarkable.

Prof. Williamson depicts a form of *L.* (*Entosolenia*) *squamosa*, var. *hexagona*, which has the appearance of two similar forms joined at their bases; while Messrs. Parker and Rupert Jones delineate three fossil structures of *L. lævis* (pl. xviii. figs. 10, 11, & 12), from the Grignon beds (Eocene), which take on a second lateral chamber. A rather interesting "wild" growth from the Java seas is depicted in fig. 5, in which the flask-shaped form not only takes on a second upper chamber, but the walls of this cell become double, and enclose a third, while a fourth chamber extends up the whole length of the exterior of the opposite side.

LAGENA VULGARIS, Williamson, var. *fissurina*, Reuss. (Figs. 6–8.)

The chief distinguishing characteristic of this group is the compression of the orifice into a wide "ornithorhynchoid" beak; and Prof. Reuss has therefore raised it to the rank of a special genus, under the name *Fissurina*. It, however, so narrowly resembles *Lagena* in all save the compression of the aperture, that it has been considered by Messrs. Parker and Rupert Jones to be insufficiently differentiated to be separated from them, from the fact that among the compressed forms of *Lagena*, many of which are included by Prof. Reuss in this genus, the orifice would naturally have a tendency to become flattened in proportion to the amount of compression of the lateral walls, especially where there is no internal tube to counteract this; and therefore the chief characteristic of *Fissurina* loses its generic value, especially as in fig. 8 is delineated a form from the Java seas in which the shell possesses a decided external neck—an occurrence which more effectually breaks down the partition-wall between *Lagena* and *Fissurina*. Still the compression of the septal aperture undoubtedly does occur even among forms provided with an internal tube (figs. 7, 8); and therefore I have for the present retained the name as that of a varietal form. Fig. 6 somewhat resembles the *F. apiculata* of Reuss (Monogr. taf. vi. fig. 85), but is more produced, while fig. 7 is an elegant entosolenian variety of the more elongated and tubeless *F. oblonga*, Reuss.

LAGENA VULGARIS, Williamson, var. *gothica*, Nov. (Fig. 9.)

Shell ovate, tapering towards the anterior, gently rounded at the base. Walls thin, hyaline, smooth, and finely foraminated. Internal tube very short and stumpy.

The external decoration is very remarkable, consisting of several delicate, narrow, longitudinal bands of milky whiteness, passing three fourths up the shell, where they curve over and form elegantly pointed arches. These are about six in number, and are very slightly, if at all, raised from the surface. The shell appears slightly broken at the orifice, and is at present the only one of the kind I have met with.

LAGENA VULGARIS typica, Williamson. (Figs. 10–13.)

These forms resemble *L. globosa* in all its many modifications of contour, the chief difference being in the possession of an external neck. The base of the shell also varies in outline, sometimes being more or less apiculate (figs. 10, 11; and *L. clavata*, William-

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son, pl. i. fig. 6), or gently rounded (fig. 12), presenting very variable and elegant shapes of water-carafes, vases, &c. The extremity of the neck is generally surrounded by a thickened marginal rim, which occasionally curves over, forming a deep lip (fig. 11).

In the globular structure depicted in fig. 11, there projects from the centre of the base what appears to be an extremely short and narrow *internal* tube, which apparently communicates with the exterior.

A similar tube I have also observed in a form of *L. striata*, and also in *L. pertusomarginata* (fig. 47); but, owing to the extreme minuteness of this tube and the smallness of the shell, its presence might easily be overlooked.

In the symmetrical form, of which fig. 13 is a copy, the stolon-tube is produced into a well-formed straight central neck, the rim of which becomes thickened, and is ornamented with a few slender recurved spines round its external margin.

LAGENA VULGARIS, Williamson. var. *glacialis*, Nov. (Fig. 14.)

Shell, symmetrical, amphora-shaped, widest just above the middle, from which it tapers towards the base, where it is bluntly rounded. Anteriorly it contracts into a prolonged wide neck, which in this specimen appears to be broken. Shell-wall transparent and glassy, composed of irregular plates of shell-substance, which crowd together and overlap each other like a field of broken ice.

No internal tube.

LAGENA VULGARIS, var. *semistriata*, Williamson. (Fig. 15.)

Shell flask-shaped, more or less elongated, resembling the typical form in its numerous gradations of contour. The posterior portion is ornamented with a variable number of fine striæ, which are sometimes very feeble, or, becoming more apparent, pass up the exterior, not unfrequently as high as the upper third of the structure. In some the striations project beyond the base, forming a coronal of sharp spikes, or the shell is provided with a small mucro. The walls vary considerably in different individuals as regards perforation and hue, in some being densely foraminated and of a dirty white colour (fig. 15), while in others they are transparent and glassy and apparently imperforate. Anteriorly the shell tapers into a more or less elongated neck, which is surmounted at the orifice by a "turned" rim. This neck is generally smooth; but in some rieties, such as the *Oolina striaticollis* of D'Orbigny (Voy. dans. l'Amér. Mérid. Foram. p. 21, tab. 5. fig. 14), it is ornamented with a neat spiral. This peculiar style of decoration, however, is not confined to these forms, being observable in *L. striata* (fig. 18), and also in *L. sulcata* (fig. 26), where it becomes greatly developed.

Fig. 15 somewhat resembles the smooth *L. vulgaris*, var. *clavata*, of Williamson; but the base is not so conical. These semistriated forms unite the smooth with the striated varieties, and are most probably but incipient growths of *L. striata*.

LAGENA VULGARIS, Williamson, var. *striata*, Montagu. (Figs. 16–20.)

The general shape of these flask-like forms is subglobular or widely elliptical, some-

times subcylindrical and elongated, passing through every intermediate modification of contour, while the shell-walls are glassy and transparent, not unfrequently being somewhat opaque and finely foraminated.

The exterior is ornamented with a variable number of thin trenchant riblets, which pass longitudinally up the shell-wall, terminating sometimes at the base of the neck or extending up its sides, and also occasionally project from the base, forming a more or less wide coronal (fig. 20). Sometimes these striations are more or less interrupted (fig. 18), some of them occupying the middle portion of the flask only.

The greater number of these forms taper towards the anterior more or less gradually into a well-formed external neck, though examples occasionally occur which are deficient in this respect. Among these is one which somewhat resembles the *L. Haidingeri*, Czížek (Reuss, Monogr. p. 326, taf. iii. fig. 41), the only apparent difference being that in the shell depicted by that author the neck is external, while in that from the Java sea the tube is introverted.

The *L. amphora* of Prof. Reuss, from the Septarian clay of Pietzpuhl (taf. iv. fig. 57), is a slightly bulged variety. In a somewhat slender form there is a small swelling near the top of the neck, which resembles the cicatrix on the body of a wounded earth-worm, the small portion of neck-tube above this being slightly bent out of the axial line—giving the appearance of having been broken, and repaired by the contained microzoon.

Around the base of the neck of the globose form depicted in fig. 18 are observable a few feeble parallel rings of exogenous shell-deposit.

In the entosolenian structures (figs. 19, 20) the walls contract towards the anterior into a very stumpy lipped neck, while the base is rounded or sharply apiculate. The shell-walls are more glassy and the striæ fewer in number than in the preceding figures, being reduced to about six. These take their origin from the margin of the rim, and pass longitudinally down the sides to the base in transparent trenchant lamellæ, which are sometimes narrow and become incorporated in a small basal mucro (fig. 19), or, becoming more strongly developed, terminate abruptly near the base, forming a coronal of knife-like edges encircling the rounded and smooth base (fig. 20). A still greater modification of surface ornamentation is occasionally met with among members of this group. In one ectosolenian form these riblets are reduced to four. These are formed by the bending over of the apertural rim of the neck, and pass down the sides in very strong blunt ribs, which are of unusual width at their commencement, but, gradually narrowing as they approach the base, project in the form of long thick spines.

LAGENA VULGARIS, Williamson, var. *striato-areolata*, Nov. (Figs. 21, 21 *a*.)

Shell subspherical, transparent, glassy, ornamented with a considerable number (upwards of forty) of fine longitudinal striæ, a few of which are continued partway up the neck. Anteriorly the flask-walls pass into a very long, straight, smooth tube of unusual length, and of equal diameter throughout. Walls minutely foraminated.

This shell, through some accident, got broken after I had made a drawing of it—a misfortune which has proved beneficial, as it has disclosed the surface of the base,

which is very remarkable. The longitudinal striæ, instead of being continued to the centre of the base, or projecting from it in a coronal of sharp spikes, as is frequently the case among these striated forms, suddenly discontinue their rib-like decoration at the extreme base of the shell, and all the striæ spread over the external surface of the base, and, anastomosing with each other, form an irregular network, the meshes of which have no constant size or shape (fig. 21 *a*).

This union of the striated and areolated styles of decoration on the same shell is, as far as my observations have gone, very uncommon.

LAGENA VULGARIS, Williamson, var. *caudata*, D'Orbigny. (Fig. 22.)

Shell symmetrical, ovate or subcylindrical, widest at the posterior half, gently tapering towards the anterior, which is more or less produced into an external neck; sometimes provided with an internal tube (*Entosolenia globosa*, var. *lineata*, Williamson, pl. i. fig. 17); posteriorly the shells are slightly truncate or gently rounded, while the extreme base is provided with a solid mucro of variable length, which frequently assumes a more caudate character, and is often slightly bent. The exterior of the shell is decorated with a variable number of longitudinal striæ.

In fig. 22 these are also supplemented by a few shorter ones, which are confined to the neighbourhood of the base. This form, though retaining a general resemblance to the *L. caudata* of Reuss, differs from it in many respects, being much more elongated, and tapering very gradually into a slender external neck, the orifice at the end of which is surrounded by a thickened rim. The basal mucro is more slender and slightly bent.

Shell-walls finely perforated.

LAGENA VULGARIS, Williamson, var. *desmophora*, Nov. (Figs. 23, 24.)

Shell hyaline, smooth; ovate, sometimes elongated, flask-shaped, passing anteriorly into a more or less produced slender neck, the end of which becomes slightly patulous and thickened round the rim. Internal tube of variable length. Externally the walls are decorated with about six bands of chainwork, passing from the base to the commencement of the neck. In fig. 23 the basal wall is very thick, being gently curved internally, but more square externally; the neck also is bent at an angle of about 35° from the axial line—an occurrence which is most probably adventitious.

The form depicted in fig. 24 is very transparent and symmetrical, having a much shorter neck and internal stolon-tube than the preceding figure. The shell is more oval, and unites on its external walls the ornamentation of figs. 19 & 23; for in addition to the longitudinal bands of chainwork on its exterior, there is a wide trenchant riblet of transparent shell-substance, running parallel to and close by one side of each "chain." This pattern is formed by two delicate lines of exogenous shell-deposit, which intertwine under and over each other by turns, forming a large and a small link alternately.

LAGENA VULGARIS, Williamson, var. *sulcata*, Walker & Jacob. (Figs. 25, 26.)

This variety, which has been chosen by Messrs. Parker and Rupert Jones as the typical form of *Lagena*, passes through every modification of contour from the subglobular to the flask-shaped or more or less elongated structures, the external neck also being often absent, or, when present, of very variable length, as also is the internal tube. The external walls are furnished with a variable number of thick longitudinal ribs, which are often blunt or rounded (fig. 25), passing from the base to the neck, which is sometimes left smooth. Not unfrequently these ribs take a somewhat spiral direction, as is seen in the flask-shaped form depicted by Messrs. Parker and Rupert Jones (Trans. Roy. Soc. vol. clv. pt. i. 1865, pl. xiii. fig. 24), and sometimes, changing their character on the external neck, wind round it in an irregular, interrupted, oblique spiral (fig. 26), or encircle it with a number of transverse parallel rings. This character is also observable on varieties of *L. striata* (fig. 18), and is seen in great perfection on a recent form of *L. hispida*, Reuss (fig. 50). Messrs. Parker and Rupert Jones have united the *L. striata*, *L. interrupta*, and *Entosolenia costata* of Prof. Williamson with this sulcate variety, to which ought to be added the *L. filicosta*, *L. mucronulata*, and *L. Villardeboana*, *L. Isabella*, with its variety *L. raricosta*, D'Orb., of Reuss (Monogr. taf. iv. figs. 50–56).

These sulcate forms appear to be of rare occurrence at this depth (1080 fathoms), the only entire specimen I have met with being that delineated in fig. 25; there are, however, a few fragments of stronger and better-developed examples (fig. 26).

The form of which fig. 25 is a representation has the ribs very blunt and rounded, some projecting slightly from the base, and extending in more or less interrupted and wavy lines to the orifice, which is wide in diameter and lipped.

LAGENA VULGARIS, Williamson, var. *marginata*, Montagu. (Figs. 27–32.)

Shell compressed, subglobular, lenticular, pyriform, or flask-shaped, passing through very diverse forms, from that of a compressed sphere to that of an elongated flask. This group constitutes the COMPRESSÆ of Prof. Reuss, and is one of the most varied of all the *Lagenæ*. The base is most generally widely rounded, though occasionally somewhat apiculate. The anterior is furnished with a more or less elongated neck-tube, which in some of the entosolenian forms is often absent. The mode in which this external tube is "set on" is subject to great modification, gently tapering in some from the flask-wall, while in others it is inserted very abruptly. The shape of the orifice is likewise inconstant, sometimes being circular, while in some of the entosolenian forms it is more or less compressed. The periphery of the shell is encircled by a wide thin marginal keel of transparent shell-substance, which varies greatly in different individuals, sometimes being hardly apparent, while in others it is very large. In some forms this thin ridge becomes greatly thickened, appearing more rib-like (figs. 34, 35), and gives rise to sharp spikes towards the base; while in other structures the periphery becomes bluntly angular (Williamson, Monogr. pl. i. figs. 19–21), and is supplemented by a smaller ridge on each side of it. In many forms these marginal outgrowths are very wide, and double, united so as to form one, like the membranes of a leaf (figs. 38, 39),

or are separate, and three or four in number (figs. 40, 41), in some of which varieties the lateral shell-wall is also ornamented with a few irregularly disposed trenchant costæ (fig. 40). This marginal keel is sometimes strengthened by a series of sharp straight spines, which project into it from the periphery of the shell (fig. 42). In fig. 43, however, these spines are somewhat modified, and assume a flat triangular shape, resembling a circlet of shark's teeth.

The foramina, as a rule, pass directly from within to the exterior, and are scattered broadcast over the whole surface. But even this is found to have its exceptions; for in fig. 28 they occupy only the margin of the shell, crowding together round it in a broad band.

The shell-walls are for the most part smooth, glassy, and finely foraminated, not unfrequently becoming considerably coarser.

These compressed forms vary greatly in their degree of compression, some being so little flattened that, were it not for the marginal border, it would undoubtedly be more appropriate to place them amongst the typical *L. vulgaris*, especially as this marginal film is seen to be in a very incipient state in many of the forms here depicted. It seems undesirable, however, to separate these less compressed and keeled forms from the true *marginatæ*; for the shell delineated in fig. 28 is evidently a form of the *L.* (*Entosolenia*) *marginata* mentioned by Messrs. Parker and Rupert Jones (Monogr. p. 349), and has the circumambient layer of shell-deposit still undeveloped round the sides and base.

So completely do these forms pass into each other through numberless intermediate gradations, that any classification of them similar to the present must necessarily be artificial—though, for the purpose of identification, it is useful thus to create, as it were, several nuclei around which each company can be congregated.

A few of these marginate organisms have their exterior covered with more or less blunted knobs, which are dispersed over the whole surface, and form an intermediate link with the Asperæ of Prof. Reuss.

Among these shells the marginal keel is found in every stage of development, sometimes making its appearance at each side of the neck or extending with a greater or less development round the periphery.

The example delineated in fig. 27 is very cylindrical, and "squared" at the two ends, the keel being confined to the base, and appearing unusually thickened, while the shell is destitute of either external or internal tube.

The orifice is provided with a circlet of tooth-like processes similar to those of the entosolenian varieties figured by Prof. Reuss (Monogr. taf. i. figs. 1–12); but this characteristic seems to be rare in the forms from this sounding, as it is the only example I have noticed in which it occurs.

It is not uncommon to find among these structures examples in which the periphery is furnished with two supplemental ribs, which become incorporated in the shell-wall. The organisms in which this is the case vary considerably in contour, sometimes being somewhat squared and entosolenian, while the same is observable on ectosolenian examples which bear a close resemblance to that figured by Prof. Williamson (Monogr. pl. i. figs. 19–21).

Fig. 28 is a somewhat flattened form, gently rounded at the base. The external tube

is short, bounded by the transparent "keel," which extends about one third down the sides, where it disappears, and again becomes apparent round the extreme base in a very narrow ridge. Internal tube bent towards one side, and ending halfway down in a trumpet mouth. Shell-walls smooth and semitransparent, the foramina being confined to the margins, where they cluster and form a wide band.

In some of the entosolenian and marginate structures two wide supplemental "plates" are observable, one on each side of the circumambient keel, but confined to the *base* only.

Fig. 29 is a very symmetrical bottle-shaped form, provided at the centre of the base with a small mucro. External neck wide and well developed, with a thick lip round the orifice, from either side of which arises the marginal border, and passes down to the base. Walls bulging, and coarsely granulated. Hue pale brownish-yellow. No internal tube.

Figs. 30, 31, appear to be essentially the same as the form depicted by Messrs. Parker and Rupert Jones (Monogr. pl. xvi. fig. 12). The walls are very glassy and smooth, and the peripheral margin translucent. In some examples the anterior portion is very pointed, but wide and rounded at the base, to which end the marginal keel is sometimes confined, while in others the shell becomes more oval, and the transparent border passes entirely round in a moderately wide and thickened band. In fig. 30 the shell becomes more lenticular, the flattened margin being well developed and very trenchant. The walls are sometimes considerably bulged, as is seen in the form delineated in fig. 31, which represents a similar shell as seen from a three-quarter basal view. The internal tube is very variable.

A remarkable modification is observable in fig. 32, the shell being compressed and the walls considerably bulged, while their exterior is covered with numerous short acicular spines; the external neck is very slender; and the periphery of the shell is encompassed by *two* narrow keels of transparent shell-substance.

LAGENA VULGARIS, Williamson, var. *radiato-marginata*, Parker and Rupert Jones. (Fig. 33.)

Shell very compressed, entosolenian, encircled at the periphery by a thickened transparent rim. Shell-walls smooth, semitransparent, the pseudopodial passages taking an oblique radial direction. These canal-pores are more strongly developed in the form from the Australian coral reefs, depicted by Messrs. Parker and Rupert Jones (Monogr. pl. xviii. fig. 3).

LAGENA VULGARIS, Williamson, var. *spinicosto-marginata*, Nov. (Figs. 34–36.)

Shell very closely resembling the preceding form in general outline; but the walls are somewhat more bulging, and the pseudopodial canals pass directly from within outwards. The thick marginal rib is still present, and gives rise to from two to four blunt or acicular spines, which project from the basal portion of the shell. In fig. 34 the spines are blunt and only two in number, projecting from the point of junction of the side walls

and the base. The shell has a very short internal tube; and a few blunt bosses are irregularly disposed over the external walls.

Some forms are provided with an additional pair of spines, which occupy the extreme base, and the knob-like protuberances are absent from the shell-walls.

In the lenticular form depicted in fig. 35 the spikes are still present; but the outlying pair are removed a little higher up the sides, the intervening space between them being occupied by a thin film of transparent shell-substance, which passes round the base. The internal tube is also deficient. Prof. Williamson has figured a young form from Shetland (Monogr. p. 10, pl. i. fig. 21 *a*) the base of which is furnished with a row of about nine sharp, feeble spikes.

In a more elongated and pyriform example represented in fig. 36 the periphery is encompassed by a narrow marginal border, which projects at the centre of the base into a two-pronged spike, one of which (perhaps originally both) bears at its apex a small round knob.

LAGENA VULGARIS, Williamson, var. *clypeato-marginata*, Nov. (Fig. 37.)

Shell subovate, somewhat shield-like and compressed, very broad at the base, and rapidly narrowing above, where it is produced into a tolerably long neck-tube, the walls of which are very solid throughout, especially at the apex, thus giving more the appearance of a straight canal than of a neck properly so called, which also passes into the interior in a very short straight internal tube. From the middle of the base project two spikes (one only being seen from each lateral aspect), which are sometimes very short and blunted.

The periphery is encompassed by a wide marginal "outwork" formed of three layers of shell-substance, which are strengthened and united for a considerable distance by a transparent rim along their outer border, originating at the anterior end, and, passing under the basal spike, overlap the base of the flask below the insertion of the spine. The two outer layers are tolerably regular in outline, and pass round the base in a gentle curve. The middle one, however, projects beyond these, and is extremely translucent and irregularly serrated. The greater part, especially the anterior portion of this compound margin, is not so glassy, being more opaque, and having a somewhat striated appearance. The walls are smooth, transparent, and very finely foraminated.

The shell appears as though it were formed by the union of two shield-like valves—an appearance which is the more noticeable from their each terminating in the long spine, and by the marginal lamellæ passing under instead of over each spike; but this, though apparently, is not really the case. A similar spike-like formation occurs also in the form depicted in fig. 41.

LAGENA VULGARIS, Williamson, var. *petasma-marginata*, Nov. (Figs. 38, 39.)

Shell ovate or globose, more or less compressed, its external walls densely covered with minute granules. The periphery of the shell is encompassed by a wide marginal

layer of semiopaque shell-substance, which in fig. 38 is also finely granulated, though to a less degree than the shell-walls proper.

In the lenticular form (fig. 38) the internal tube extends nearly to the bottom of the cavity, and passes out at its upper part, forming a short external canal embedded in the outlying film, and widens out at the aperture, where it becomes lipped. The marginal lamina appears to be double, being formed by two layers which are united like the membranes of a leaf, and passes down the upper part of the shell in a wide even band. In fig. 38 this regularity of outline suddenly ceases round the basal half of the periphery, the marginal layer becoming irregularly and deeply rowelled.

LAGENA VULGARIS, Williamson, var. *bracteato-marginata*, Nov. (Figs. 40, 41.)

Shell subspherical, somewhat compressed, entosolenian, the tube passing to the extreme base of the cavity, where its free end becomes patulous. Anteriorly the tube passes out of the flask to a variable distance, resembling more a canal than an external neck, as it is still embedded in the shell-substance. Around the periphery project three or more wide lamelliform plates of great transparency, parallel to each other, though quite distinct, the middle one often being the most prominent. The marginal border of these layers is tolerably even at the apertural end of the shell; but it becomes very irregular round the basal half, where these filmy plates sometimes become so translucent that it is often difficult to follow their outline, and to count with certainty the number of "plates." The lateral walls of the shell are also sometimes furnished with a greater or less number of trenchant riblets, as in fig. 40, where there are three on either side. In this form the walls are whitish, semitransparent, and coarsely foraminated, while others are more opaque, and of a light brown tint.

Fig. 41 differs considerably from the preceding shell, being very smooth and glassy, while the walls are apparently imperforate. The marginal plates are about four in number, and are laid side by side more compactly than in the above-mentioned examples, and pass round the periphery with more regularity and evenness throughout, the serrated portion being more regular, and confined to the extreme base. Around the margin of (and immediately on) the shell-wall is also an additional narrow flattened ridge, which becomes lost in the walls at the upper part; while at the extreme base, on each side, projects a thin pointed spine, similar to that observable in fig. 37.

LAGENA VULGARIS, Williamson, var. *spinoso-marginata*, Nov. (Figs. 42, 43.)

Shell subglobular, lenticular, or ovoid, smooth, densely foraminated. External neck long, straight, and narrow, passing abruptly from the upper end of the structure, and patulous, lipped, and sometimes "scalloped" round its outer rim. The peripheral margin of the shell is ornamented with a wide single or double layer of shell-substance, which passes two thirds up the neck, and becomes incorporated in its walls. In fig. 42 this band is single, and of film-like transparency, and is strengthened by a series of long, slender, straight spines, which radiate from the circumference of the shell, and form a single and parallel row round the flask. At the middle of the base these spines become

rather longer and somewhat bent; and at the anterior extremity, near the point of insertion of the neck-tube, they are deficient, their place being supplied by long filamentous appearances, which are apparently minute canals. The walls in this specimen are very coarsely foraminated, and the tubular neck considerably elongated, being about once and a half the length of the ovoid portion. This tube still contains what is apparently the dried sarcode stolon of the once living Foraminifer. A form in all respects similar to fig. 42, but which, unfortunately, was accidentally broken, had an additional row of shorter spines around the periphery, but recurved, so as to form a secondary circlet bent back over the margin of the shell proper.

The form delineated in fig. 42 is somewhat defective—the flask-walls being broken, and the marginal film incomplete at the base.

In the more lenticular form (fig. 43) the shell-walls are more transparent, and finely perforated, while the external neck is considerably shorter. The marginal border appears to be composed of a double layer of shell-substance; while on each side of this the spines of fig. 42 are represented by a circlet of short, flat, triangular processes of a milky-white hue, somewhat resembling a shark's teeth, and which project from the periphery of the shell. At the centre of the base, below this outlying border, is visible a very minute transparent spike.

LAGENA VULGARIS, Williamson, var. *alato-marginata*, Nov. (Fig. 44.)

Shell symmetrical, flask-shaped, occasionally somewhat elongated. Walls sparsely scattered over with small granules. External neck short, sometimes formed by the gradual tapering of the shell-walls, or more abruptly inserted. Internal tube short. Sometimes the diameter of the flask is widest below the middle, or the walls become more straight, while the base is gently rounded. The periphery of the shell is encompassed by a narrow thickened keel, which is sometimes transparent or somewhat granulated (fig. 44), and disappears about halfway up the neck. Along the sides of the neck appears a second pair of marginal outgrowths, which, originating at the summit of the neck, pass down its two sides over the before-mentioned keel, and terminate somewhat abruptly at some point along the anterior half of the shell. These wing-like processes are crowded with small granules along their inner margin, their outer border remaining of glassy transparency.

LAGENA VULGARIS, Williamson, var. *clavato-marginata*, Nov. (Fig. 45.)

Shell ovate, very slightly compressed, transparent, tapering slightly towards both ends, rounded at the base, and narrowing anteriorly into a short wide neck, at the summit of which is situated the aperture, surrounded by a thickened rim. In general outline it somewhat resembles a slightly bulged "soda-water-bottle." Internal tube narrow, reaching about halfway down, and slightly widening towards its free end. The periphery is bordered by three transparent lamelliform "keels," which encompass the whole shell, and terminate just below the everted apertural lip, the middle one being the largest, and projecting furthest from the flask.

The shell is further decorated by four longitudinal rows of blunt or rounded bosses, a few minute granules being also sparsely scattered over the otherwise smooth surface.

LAGENA VULGARIS, Williamson, var. *pertuso-marginata*, Nov. (Figs. 46, 47.)

These elegant, symmetrical, flask-shaped structures are chiefly characterized by the perforation of their shell-walls, the external surface being covered with deep "pittings," in the hollow of each of which the pseudopodial orifices most probably open. In fig. 46, which appears to be a young shell, the pittings are smaller and the walls transparent; while in the more opaque form, delineated in fig. 47, the perforations are larger, and are visible only partway up the neck, the upper half of which suddenly becomes imperforate and glassy. The anterior of these shells tapers more or less gradually into a well-developed external neck, the orifice of which, in fig. 46, is encircled by a patulous and lipped border. The periphery of the flask is encompassed by a marginal keel, which in fig. 46 is very narrow and translucent, passing completely round the base and up the sides of the neck; while in fig. 47 it presents a more plicated appearance and is more opaque, in addition to which it is absent at the extreme base, and also at the upper part of the neck. The base of this form (fig. 47) is provided with an exceedingly short basal tube of very narrow diameter, which projects into the shell. This would seem to indicate the existence of an orifice at the basal end also; and on subjecting it to a high magnification such appears to be the case. The tube, which measures about $\frac{1}{1300}$ of an inch in length by $\frac{1}{3000}$ of an inch in diameter, communicates with the exterior of the shell by an orifice of equally small dimensions, but which does not project externally beyond the shell-wall. A basal tube in all respects similar to the above is also present in fig. 12.

LAGENA VULGARIS, Williamson, var. *helophoro-marginata*, Nov. (Fig. 48.)

Shell subglobular, compressed; walls thick, of a dirty white hue, widely curved at the base and anterior end, and covered with blunt rounded bosses. Internal tube flexuous, reaching almost to the bottom. Anteriorly this tube passes out into a short neck, the orifice of which is thickened by a "turned" rim. Around the periphery of the shell passes a narrow, trenchant, keel-like, transparent band, which extends along either side of the external neck-tube, enveloping it, and giving it the appearance rather of a straight tubular canal than of a neck. At the base this projecting keel forms two transparent and blunt horns, between which is a third and smaller one.

In external ornamentation this form bears a close resemblance to the *L. aspera* and *L. rudis* of Reuss (Monogr. taf. vi. figs. 81, 82); but, unlike them, it is provided with the marginal keel and external neck-tube.

LAGENA VULGARIS, Williamson, var. *siliqua*, Nov. (Fig. 49.)

Among the innumerable protean forms which are found among these monothalamous organisms, one occasionally meets with shells which depart so greatly from the true *Lagena* character, that it becomes a matter of some difficulty to determine whether they are true varietal forms or merely abnormal growths.

The shell represented in fig. 49 is perhaps one of the most remarkable, differing con-

siderably from the ordinary *Lagenæ*, yet still presenting points of resemblance which are unmistakable.

The general outline of the whole organism is somewhat spindle-shaped—being very long, and gently tapering towards either end, not unlike a pair-oared "outrigger."

About the middle of the whole length of the structure is situated the central cavity, which is small, ovate, and compressed, but slightly peaked at its basal end. From the middle of the anterior portion of the flask extends a very long, slender, and straight tube, which, passing through a second chamber, enters a long straight neck, the orifice of which is surrounded by a coronal of short blunt denticulations.

This second chamber laps round the anterior portion of the ovate central cavity in the same axial line, its side walls being moderately straight, and its anterior inner wall gently arched, though the outer ones taper into the long external neck. At both sides of the central cavity the walls of this chamber are continued, passing down in the form of a very narrow, blunt, angular ridge, which, encompassing the whole basal half of the central cavity, project in one long flattened and tapering basal apophysis, the extremity of which is solid and slightly blunted.

On each lateral aspect of the shell are two remarkable lamelliform riblets, one on either side, which, emerging from the shell-walls of the foremost cavity, pass down in a very narrow ridge, and, extending round the base in two plate-like layers, reach far down the basal prolongation, where they gradually disappear in the more solid shell-substance.

This shell, which is unique in my cabinet, unites in its structure the characteristics of the marginate with those of the apiculate series, though the amount of apiculation is exaggerated beyond that of any shell I have seen in the latter group.

Its walls are semitransparent and smooth, and are perforated with rather coarse pseudopodial orifices.

LAGENA VULGARIS, Williamson, var. *hispida*, Reuss. (Fig. 50.)

Shell of very variable contour, being sometimes globular, sometimes ovate, or more narrow and elongated; the base widely rounded. Anteriorly the shell gently tapers, or is produced more or less abruptly into a long slender external neck. The shell-walls are densely covered with thin spines, which are sometimes continued up the neck. In fig. 50, however, these spines are small, and absent from the neck, which is inserted very abruptly into the chambered portion, and is ornamented throughout with a number of parallel rings, about 23, which occupy the entire neck from its junction with the body to its free end, the rings becoming smaller and closer together towards the terminal aperture.

A somewhat similar appearance is also observable in *L. striata* (fig. 18), though in a less degree, and in the *Oolina striaticollis* of D'Orbigny (Voy. dans l'Amér. Mérid. Foram. p. 21, tab. 5. fig. 14).

The colour of the shell is a dirty brownish white. Occasionally one meets with flask-shaped forms which have this external ornamentation greatly modified (the surface being densely covered with minute granular protuberances), and which seem to form a connecting link between the LÆVIGATÆ and ASPERÆ of Prof. Reuss. These are essentially

the same as the fossil form depicted by that author (Monogr. taf. v. fig. 66) from the Septarian clay of Pietzpuhl, near Potsdam, and which Prof. Reuss raised to the rank of a special genus under the name of *L. oxystoma*. These characteristics, however, are too variable to be of importance.

LAGENA VULGARIS, var. *squamosa*, Williamson. (Fig. 51.)

Shell subglobular or ovate, slightly compressed, somewhat prolonged anteriorly, at the centre of which is situated the aperture. Walls semiopaque and of a dirty white hue. Internal tube short. The external surface is ornamented with numerous large areolæ, arranged in longitudinal rows, each series of areolar spaces being so disposed that the transverse walls of each alternate with those on either side of it.

In the form here depicted these depressions are very large and four-sided, their lateral diameter being generally greatest. These quadrilateral spaces, however, have a tendency to become hexagonal, the shell being evidently a marginate variety of *E. squamosa*, var. *scalariformis*, of Prof. Williamson (Monogr. p. 13, pl. i. fig. 30), though the longitudinal ridges in the form here delineated (fig. 51) are almost straight instead of being zigzag, and are, together with the transverse ribs, very well developed and trenchant. The periphery of the shell is encompassed by a well-developed marginal keel.

Dr. Macgillivray has noticed this compressed character in his *Lagenula reticulata* ('Molluscous Animals of Aberdeen,' p. 28), which Prof. Williamson, however, considered to be merely adventitious; but the shell here depicted, the only reticulate form I have met with in this sounding, has this peculiarity very apparent; and I am therefore inclined to regard it as a normal variety of the Reticulate series, with which it forms an intermediate link.

LAGENA VULGARIS, Williamson, var. *ampulla-distoma*, Nov. (Fig. 52.)

This shell closely resembles some of the varieties of *L. globosa*, having the shape of a distended globe, the walls, however, being roughened by exogenous shell-deposit. From the anterior of the shell there projects an internal straight tube, passing three fourths down the cavity, and terminating in a trumpet-shaped orifice; at the centre of the base, however, there projects a short external tube in the same axial line as the internal one. Owing to its roughened exterior, it cannot be classed among the smooth forms of *L. distoma-polita* of Messrs. Parker and Rupert Jones; and therefore it must, for the present at any rate, be considered a separate variety, for which I propose the designation *L. ampulla-distoma*.

These distomatous organisms are connected with the smooth entosolenian varieties through the apiculate forms, to which they are closely allied, the base of the shell being more or less drawn out and perforated (see, for example, fig. 53). Messrs. Parker and Rupert Jones have united these with the apiculate varieties under the names *L. apiculata*, Reuss, and *caudata*, D'Orbigny (Monogr. p. 358); but as I have already adopted D'Orbigny's name *caudata* for the striated form depicted in fig. 22, which also in this respect resembles his *Oolina caudata*, I have united the organism depicted in fig. 53

with the variety *L. distoma-polita*, Parker and Rupert Jones, restricting the designation *L. apiculata* of Reuss to those structures which, though more or less produced and pointed at the base, are still unprovided with an aperture *.

LAGENA VULGARIS, Williamson, var. *distoma-polita*, Parker and Rupert Jones. (Figs. 53–57.)

This elongated distomatous variety, which is generally smooth, semitransparent, and finely foraminated, is subject to considerable modification of contour. Most commonly it is a slender fusiform shell, tapering towards each end to a narrow tube, one of which is sometimes prolonged into a well-formed neck, with a flattened rim encircling the aperture, the other tube, though occasionally long, not unfrequently being very short and undeveloped.

In some forms (fig. 56) the greatest width is in the middle of the shell, where it becomes decidedly angular; and the axis of the shell in this particular form is slightly curved. Messrs. Parker and Rupert Jones figure a somewhat similar example from the Red Sea and Australia, which, however, is perfectly straight (Monogr. pl. xiii. fig. 8).

Sometimes the greatest diameter is removed nearer one end, and the shell becomes more or less amphora-shaped (Messrs. Parker and Rupert Jones, Monogr. pl. xiii. fig. 21), several examples of which occur in these soundings; or the walls taper equally towards each end, both the necks being equal and very slender (fig. 55).

An elongated smooth form is depicted in fig. 53, the anterior being provided with a fissurine orifice, communicating with the interior through a straight internal tube, while the base gradually tapers into a second narrow infundibular prolongation of considerable length.

A rather interesting modification of the distomatous series is observable in fig. 54. In this form the chambered portion, or shell proper, is more or less elongated, narrowing at either end, the upper part passing into a very long and neck-like extension, which in fig. 54 is almost as wide as the flask-shaped body. The lower end of the shell is also slightly drawn out, and furnished with a basal aperture, which in some forms is equal in diameter to that at the opposite end, but in fig. 54 is much smaller. In the figure here delineated this long tube appears broken; and in a somewhat similar structure in my cabinet, which is even more elongated, though the neck is slightly narrower in diameter, both ends seem to be defective, so that how far it extended when entire I am unable to say. Shell-walls smooth and semitransparent.

A still more remarkable form is depicted in fig. 57. It consists of an extremely long, smooth, and symmetrical distomatous structure, having the appearance of two simple flasks which have sprung from the base of a third in the same axial line, the shell-walls being continuous throughout. The largest of these portions has the form of a long, narrow, truncated cone, tapering gradually towards one end almost to the extremity, at the apex of which is situated a very small circular orifice. At the "basal" end of this

* The *L. sulcata*, var. *distoma*, of Messrs. Parker and Rupert Jones (Monogr. p. 356, pl. xiii. fig. 20), is a costulate spindle-shaped *Lagena*; but I have not met with any striated distomatous forms in this sounding, and therefore the above-described shell and all the succeeding forms of this series are arranged as subvarieties of that organism.

portion the shell-walls contract for a short distance, but soon bulge out again, and form a second flask, with the two bases in juxtaposition. The body of this middle chamber is rather stunted, its strength having been apparently expended in the formation of a very disproportionately long neck, which again widens out into a symmetrical flask-shaped body, more ovate in form and somewhat wider in diameter than the preceding chamber, the anterior part being also produced into a short straight neck. The shell is unique in my collection, although I have met with a few forms which might possibly be fragments of similar organisms, and would seem to connect *Lagena* with *Nodosarina*.

LAGENA VULGARIS, Williamson, var. *distoma-patera*, Nov. (Fig. 58.)

Shell somewhat goblet-shaped, with very bulging walls, slightly contracted round the top, where it terminates suddenly. Posteriorly the walls are well rounded; and from the middle of the base projects an external tube of variable length and diameter. This tube is formed by the inflection of the shell-walls, and terminates very abruptly. The shell is of a dirty white hue and very coarsely foraminated, the external walls also sometimes becoming irregular with exogenous shell-deposit. The basal tube has evidently been slightly broken; whether this is the case with both ends I do not know; but I have met with many forms of this shell, and, though varying slightly in contour, they all present very little difference from the example here delineated.

In general outline this somewhat resembles the smooth form shown in fig. 54, the neck being deficient and the basal tube more perfect.

LAGENA VULGARIS, Williamson, var. *Janeta*, Nov. (Figs. 59, 59*a*.)

This shell is perhaps the most remarkable and interesting of all the distomatous forms, having a peculiarity of structure which is unexampled in any other of these microzoic forms. The shell-walls throughout are smooth and glassy, being also apparently imperforate. The anterior portion of the structure has the form of a very elegantly shaped flask, the base of which is rounded, and provided at its centre with a very small circular orifice. This flask rests in, and opens into, a small "cup," which has a slight constriction round its walls, and is perforated at its posterior extremity. From the base of this cup the shell-walls form a long tube, which commences by turning suddenly to one side, out of the axial line, and, enveloping part of the side wall of the cup, makes the channel of communication only half the width it would otherwise have been. It then takes a downward course, though still at a considerable angle, and, widening gradually as it increases in length, terminates very abruptly, after having attained more than half the length of the entire structure.

Whether this is an adventitious or a normal growth, I leave for future investigations to solve. For the present, at any rate, it must be enrolled as a distinct variety.

Fig. 59*a* represents a sectional outline, showing more clearly the details of the structure.

LAGENA VULGARIS, Williamson, var. *bicamerata*, Nov. (Figs. 60–62.)

Shell consisting of two chambers, the primordial one being more or less globular, and

sometimes compressed. The second chamber encloses the anterior portion of the primordial one, into which the latter opens by a very "sessile" and wide central aperture. This orifice, however, may be provided with a short-lipped neck. The second chamber is generally very large and flask-shaped or globose, the walls being sometimes very bulging and produced at the anterior end into a long, central, more or less slender stolon tube. The aperture is sometimes dentate, or is encircled by a smooth lip, the outer margin of which is occasionally "scalloped."

The form depicted in fig. 60 appears to be more allied to the marginate series, the primordial chamber being lenticular, compressed, and surrounded by a well-developed, thick marginal keel, terminating on each side of the aperture, which is central, "sessile," and inside the second chamber. This second portion is also slightly compressed, embracing the primordial one at about its anterior fourth. In outline it is somewhat bottle-shaped, tapering forwards into a well-developed neck, which swells out slightly at the apex, where it is largely dentate.

This chamber is somewhat bent out of the axial line, and is not unlike a champagne-bottle—a simile which the dentate aperture rather strengthens.

Along the two sides of the neck also extends a transparent ridge, which, however, is more developed on one side than on the other, and is soon lost in the shell-walls, which are semitransparent, white, and densely foraminated. These canal pores are differently disposed in the two chambers, those of the larger one passing directly from within outwards, while those of the primordial chamber take a radial direction, similar to the form depicted in fig. 33.

A double-chambered *Lagena* is represented in fig. 61, the primordial one of which is provided at its base with a small central mucro. The walls are finely foraminated and ornamented with about fourteen delicate longitudinal riblets. A little above the middle it becomes enclosed by the second chamber, into which it opens through a stumpy neck. This portion of the structure is much larger, presenting the appearance of a very bulging, symmetrical, smooth flask, passing at the anterior end into a well-developed neck, which in this example is somewhat broken. The walls of this flask are also finely perforated, but, unlike the primordial chamber, are perfectly smooth and ribless.

Fig. 62 closely resembles fig. 61 in general outline—the upper flask, however, being much more bulged, and the neck more fully developed and lipped at its termination. The external margin of this rim is also prettily "scalloped," and the neck-walls ornamented with a few minute and feeble tubercles scattered over it.

The primordial chamber is somewhat compressed, and encircled by a thick marginal keel, which bears a small mucro at the centre of the base. The inferior portion of this chamber is decorated with a few feeble riblets, which are very rudimentary, and confined to the base. The larger chamber, however, is ornamented with about fourteen well-developed longitudinal riblets, which pass up the exterior and disappear at the base of the neck. Both the chambers are finely foraminated; but in the primordial one these perforations assume a radial direction, a few only (those occupying the central part and those of the larger chamber-walls) passing directly from within outwards. The primordial chamber appears broken short immediately after entering the base of the anterior one.

These double-chambered forms might possibly, at first sight, be regarded as belonging rather to the *Nodosariæ* than to the *Lagenæ*; but from a careful examination of the forms which have come under my own observation, I am inclined to consider them true varietal forms of *Lagena*.

Dr. Wallich depicts an elongated and striated two-celled form (North Atlantic Sea-bed, pl. v. fig. 18; and Messrs. Parker and Rupert Jones, Monogr. pl. xviii. fig. 13), which may be regarded as either a two-chambered *Lagena* or *Nodosaria scalaris*, Batsch; but the development of the upper chamber in the forms delineated in figs. 61 & 62, together with the several minor characteristics which they have in common with other *Lagenæ*, allies them more intimately with the former than with the Nodosarine series.

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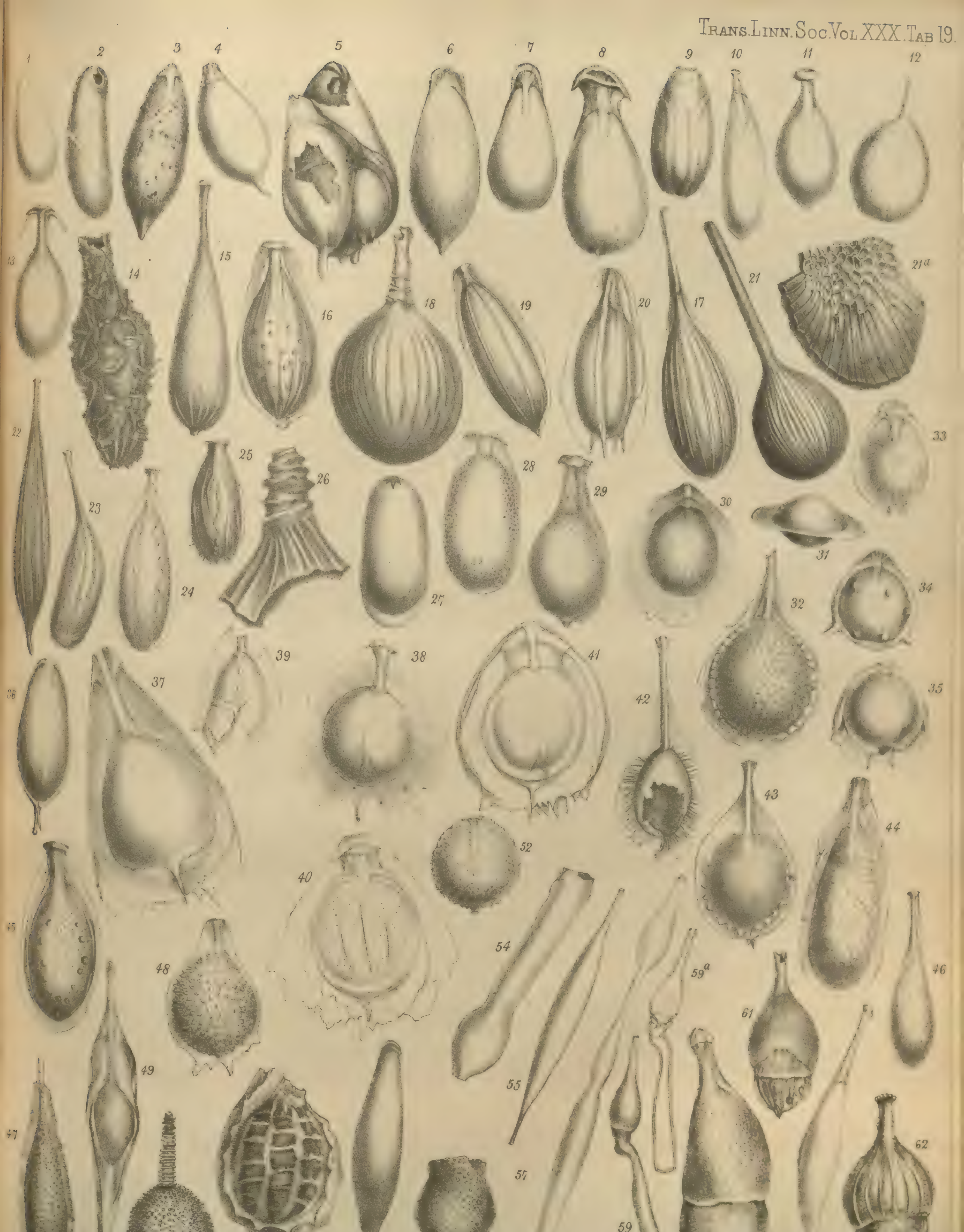
NOTE.

The temperature of 47° F. at 1080 fathoms may seem somewhat higher than might be expected at that depth; but this portion of the ocean is so enclosed by shoals and reefs, that the deeper and colder waters of the more open seas are in a great measure cut off; and consequently, though its depth is considerable, its temperature is much higher than at equal depths in the outer ocean. A similar contrast is observable between the temperature of the Sulu Sea and that of the China Sea, as shown by observations made by Commander Chimmo, the temperature in the former being as high as 50° F. at the depth of 1778 fathoms.

The thermometers used for these soundings were "Johnson's patent metallic spring," placed in stout perforated gutta-percha cases.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III. *On the Habits, Structure, and Relations of the Three-banded Armadillo* (Tolypeutes conurus, *Is. Geoff.*). *By* Dr. James Murie, *F.L.S., F.G.S., &c.*

(Plates XX.–XXVI.)

Read February 15th, 1872.

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I. Introductory and Remarks concerning Habits.

On the vast continent of South America, the present home of the Edentates or Bruta, now and again remains of colossal animals turn up, which, studied in the light of anatomy, reveal the existence of an ancient fauna typical of more recent forms. These old denizens of the tropical glade and plain, whilst foreshadowing the construction now borne by their comparatively tiny heirs of the realm, yet, ancestral-like, possessed solid characters of their own. Such characters, though firmly impressed on their skeletons, are less conspicuous than the majestic magnitude of the animals themselves. To the travellers and naturalists who have exhumed, under difficulties, those heirlooms of past ages, all honour is due. No less creditable is it to palæontologists that they should press on through toil and moil revivifying to the wondering multitude snatches of that long vista of the cainozoic times. Here the labours of the zoologist and anatomist supply data from the present fauna which unfold the known and often explain the unknown. Thus what may be supposed trivial details are afterwards frequently of the highest service in expounding abstruse points.

Preceding writers have sufficiently called attention to the anatomical and palæontological memoirs[1] on the Loricate section of the Edentata, in which the names of Cuvier, Owen, Rapp, Lund, and Burmeister take a first rank. The latter, as Director of the Museum at Buenos Ayres, has lately kindled afresh the interest concerning fossil Eden-

[1] As regards the history of the discovery and determination of the remains of the Hoplophoridæ, consult Part i. of Huxley's paper "On the Osteology of the genus *Glyptodon*" (Trans. Roy. Soc. 1865, p. 31).

tates, and in his series of splendid monographs has shed a halo of honour on the institution with which he is connected. Long may this tried savant be spared to continue the good work!

Live Armadillos are far from uncommon in the menageries of this country; nevertheless few, if indeed any, of the three-banded species have hitherto been imported, except the subject of the present sketch. Its rarity is equalled by its being one of the most interesting forms of the group. Of the organization of the species, save carapace and skeleton, in part, there is, I believe, no published record. To make good this gap in the literature of the Edentates is the object of the paper now laid before the Fellows of the Linnean Society.

The animal, a full-grown male, was received by the Zoological Society, in exchange, March 4th, 1865; and it lived and was exhibited in the Regent's Park Gardens until June 8th 1866. For a considerable time it was kept in one of the monkey-cages along with some other species of the Armadillo tribe. This afforded a good opportunity for watching and comparing the habits of the different kinds.

The deportment of the commoner species, the Weasel-headed Armadillo (*Dasypus sexcinctus*) and the Peba (*Tatusia peba*), is in many ways very different from the Mataco or Three-banded Armadillo (*Tolypeutes conurus*). This contrast is the more marked, seeing that the bodies of the two former are (one would suppose from the number of their movable zones) better adapted for being coiled together than is that of the more rigid-shielded latter animal. Be this as it may, when in confinement the following peculiarities are very evident.

The Peba and Encoubert are by no means sluggish animals, which their heavy and squat figure seems to betoken. In the large cage they walk and amble about generally as if intently tracking some faint scent or searching for earth-hidden edible treasure; hither and thither they wander, carrying their head down-fixed and sniffing, their tail almost trailing on the ground behind, and their stout somewhat waddling body supported on the full length of the soles of their feet.

Not so *Tolypeutes*; for his is the active sprightly gait of a light-footed messenger, in spite of more solid cuirass. The body is more lofty and narrow, the legs longer, slenderer, and the fore ones with immense nails. The tail usually hangs perpendicularly, and distant from the ground, as is the head. But, strangest of all, he poises himself on tiptoe, and, as if on hasty errand, trips trot, trot forwards and trot, trot backwards, ever speeding in ceaseless journey.

The commoner Armadillos seem heavier sleepers during the daytime than is the three-banded species. The latter, as I shall more particularly describe, at such times rolls itself into a ball; the former bend themselves snugly together, but without assuming a spherical figure.

In the Gardens the same food was given to all—namely, bits of raw chopped meat, hard-boiled eggs, and bread and milk. These they appear to relish and thrive on. In partaking of food they employ the tongue much, which is rapidly protruded and withdrawn Anteater-fashion, but of course with nothing like the elongate thrust and spiral recoil peculiar to *Myrmecophaga*.

Lastly, I may incidentally recount a scene of drollery between the Armadillos and their mischievous companions the monkeys. Occasionally, and when in high spirits, the latter take to teasing the former. Watching the harmless and defenceless *Dasypus* issue from his sleeping-box, one monkey, more bold and fuller of fun than his brethren, would suddenly catch hold of the Armadillo's tail and drag him backwards. With frantic glee and chattering, the monkey's companions join; and all who can lay hold, haul might and main, and tumble and toss about our scaled friend to their heart's delight, in spite of his scratchings and struggles. But once caught, again shy; and a touch would send Armadillo bolt into his sleeping-berth, only to emerge thenceforth as dusk approached and the enemy retired to rest. With *Tolypeutes* such a game was not so easily played; the short tail, in his case, was tucked in; head and legs followed; and there lay a solid ball, which they poked about rather suspiciously, and did not quite enjoy the long sharp claws, or were suddenly scared and fled as the sphere started to its feet and set off at a rapid run.

In the subjoined footnote [1] I make some extracts from travellers who have witnessed the Armadillos and our species in their wild state.

[1] A free translation from Azara runs thus:—The habitat of the Tatou Mataco [*Tolypeutes conurus*] is southwards of the 36th degree. It is the only species of this family that, when frightened, hides its head, tail, and fore legs by rolling its whole body into a ball, which cannot be opened with the hands; but it is easily killed by striking it against the ground. It walks always with the body contracted, and more slowly than the other species. The fore and hind legs are weaker; and the claws are so little adapted to dig the earth, that I doubt if they are used for that purpose. It is fourteen inches long without the tail, which is two inches and two-thirds in length; the root of it is not round, as in the other species, but flat, and covered with scales, shaped like large grains or projecting knobs. It has three dorsal bands, broad above and narrow at the ends. Its scales are irregular, rough, and of a dull leaden hue. It has five toes to the hind foot, and four to the front ones.—*Apuntamientos*, vol. ii. p. 161.

In recounting facts concerning the Armadillos, it is said, "When hard pressed by the hunters they frequently contract and roll themselves down a precipice like a hedgehog, and usually escape without injury, being protected by their coat of mail; but they have not the same means of escape when they are found in the plains; they are then easily taken; and when they roll themselves up are compelled to resume their natural form by means of fire. The three-banded species run very fast in a straight line, being prevented by the conformation of the armour from making turns."—*Hist. of Chili*, translated by Abbé Don J. Ignatius Molina, Lond. 1809, vol. i. p. 253.

Darwin, in his 'Journal of the Voyage of the "Adventure" and "Beagle,"' (vol. iii. p. 113) remarks:—"Of Armadillos three species occur, namely the *Dasypus* [*Euphractus*] *minutus* or Pichy, the *D.* [*E.*] *villosus* or Peludo, and the Apar [*Tolypeutes tricinctus*?]. The first extends as far south as lat. 50°, which is about ten degrees further than any other kind. A fourth species, the Mulita [*Tatusia hybrida*?] only extends as far south as the Sierra Tapalguen, lat. 37° 20′, which is north of Bahia Blanca. The four species have nearly similar habits; the Peludo, however, is nocturnal, while the others wander by day over the plains, feeding on beetles, larvæ, roots, and even small snakes. The Apar, commonly called Mataco, is remarkable by having three movable bands, the rest of its tessellated corneous covering being nearly inflexible. It has the power of rolling itself into a perfect sphere, like one kind of English woodlouse. In this state it is safe from the attack of dogs; for the dog not being able to take the whole into his mouth, tries to bite one side, and the ball slips away. The smooth hard covering of the Mataco offers a better defence than the sharp spines of the Hedgehog. The Pichy prefers a very dry soil; and the sand dunes near the coast, where for many months it can never taste water, are its favourite resort. In the course of a day's ride near Bahia Blanca several were generally met with. The instant one was perceived it was necessary, in order to catch it, almost to tumble off one's horse; for if the soil was soft the animal burrowed so quickly that its hind quarters had almost disappeared before one could alight. The Pichy likewise often tries to escape notice by squatting close to the ground."

II. Table of Measurements of the Body, Head, and Limbs.

	inches.
Body.—Total length from tip of nose to tip of tail in straight line	12·75
Vertical thickness (depth) opposite movable zones	3·30
Scapular shield.—Length along a curve in the middle line of back	2·65
Length at lower edge from angle to angle	2·80
Distance between its anterior angles	1·85
Distance between its posterior angles	3·00
Three movable zones.—Length along the middle of back	1·80
Pelvic shield.—Length following curve in middle line of back	6·30
Length along lower edge from angle to angle	3·75
Distance between its anterior angles	3·65
Distance between its posterior angles	1·10
Thoracic chamber.—(Fore limb) antero-posterior measurement	2·90
(Fore limb) depth, taken from free edge of scapular shield	2·90
Abdominal chamber.—(Hind limb) antero-posterior measurement	3·40
(Hind limb) depth	3·70
Isthmus separating the chambers for the fore and hind limbs	1·10
Head.—Length from end of snout to occipital end of cephalic shield	3·20
Length from snout to the inner canthus	1·65
Length from snout to root of ear	2·40
Width at level of the ears	1·40
Length of gape	1·10
Distance from end of snout to anterior end of sternum	4·00
Ear.—Long diameter	1·25
Width	1·00
Eye.—Length	0·35
Tail.—Length from the hinder edge of anus to end of tail	2·70
Length of the free part	1·80
Width at the root	1·40
Width nine tenths of an inch from the apex	0·50
Thickness (depth) at root	0·80
Thickness nine tenths of an inch from the apex	0·65
Teats.—Two in number; each in length	0·15
Distance from end of sternum to line joining the teats	1·10
Distance between the two	0·90
Distance from a line joining these to the root of the penis	3·50
Penis.—Length	4·50
Diameter at root	0·90
Diameter at end of prepuce (glans)	0·25
Anus.—Distant from the posterior margin of penis	0·75
Diameter	0·30
Fore limb.—Extreme length from axilla to point of longest claw	4·40
Length from olecranon to root of carpus	2·10
Length from root of carpus to end of longest claw (in a straight line)	2·00
Greatest breadth of the palm	0·45
Claw of second toe, length in a straight line	0·60
Claw of third toe, length in a straight line	1·40

	inches.
Fore limb.—Claw of fourth toe, length in a straight line	0·80
Hind limb.—Length from groin to extremity of longest toe, with limbs fully extended	4·65
Length from knee to ankle	2·50
Length from extremity of heel to end of middle toe	1·80
Length from extremity of heel to end of inner toe	1·30
Length from extremity of heel to end of outer toe	1·20
Greatest breadth of the sole of foot	0·60

III. Description of the Body Exteriorly.

1. *Aspects when in motion, rolled up, and extended.*

The attitude of the animal during life and when running about was such that the cephalic shield looked almost directed forwards; and the dorsal line of the body formed a tolerably even curve from the one end to the other. The body was supported upon the tips of the great claws of the fore limb and upon the anterior callosities of the hind limb, the heel being raised. In this attitude it moved at a very rapid trot. Pl. XX. represents the animal in the said act. The drawing, an accurate copy from a photograph, is very characteristic, although it is from the dead body, which I fixed in as life-like a posture as possible.

The tail, in spite of its massive defensive armour almost indissolubly welded to the bones at its termination, is nevertheless provided with the same musculo-tendinous distribution which obtains in such perfection in those mammals whose lengthened caudal appendage is an instrument empowered with movement in every direction. Lateral, and especially upward motion of the tail in *Tolypeutes* is necessarily of a limited kind, and lashing or curling is per force checked; but, on the other hand, an almost hinge-like movement is attained in perfection. Usually the tail hangs nearly perpendicular to the end of the pelvic shield; but in the rolling-up action of the body the tail is flapped inwards, and lies flattened alongside the head upon the abdominal parietes.

When the animal coiled itself up, the cephalic shield closed the anterior aperture of the scapular shield, the ears being folded up in the interval between the two. The posterior angles of the scapular shield, passing over the lateral scutes of the free zones, which closely overlap one another, fitted into the groove between the marginal scutes of the greater part of the pelvic shield and the incurved lateral scutes of the anterior transverse row of that shield. The extremity of the tail passed up on one side of the head, between the cephalic shield and the scapular shield; a small interval, however, by which the animal could breathe, was left between the head and tail and the approximated edges of the scapular shields. In this position the legs were retracted into chambers, which will afterwards be described. By extension I allude to the flaccid condition of the body when the spine is partially straightened the movable zones apart below. The head then hangs loosely forwards, the tail backwards, and the limbs drop, folded or partially so, into their respective chambers (*vide* Pl. XXII.).

2. *The Dermal Armour.*

The dermal armour is divisible into a cephalic shield, scapular shield, three movable zones, pelvic shield, and the caudal armour. But there are no nuchal scutes, such as

exist in *Dasypus sexcinctus*: the integument of the back of the neck is quite soft and flexible, presenting only a few scattered longish hairs.

Cephalic Shield.—This is ovoid in contour, the anterior end being pointed, and the posterior end narrow and rounded. Its length is three inches, and its greatest width is 1·5 inch, the position of the greatest width being 2·3 inches from the anterior end. It consists of a series of principal marginal scutes and scales, enclosing a number of central scales, and flanked anteriorly by some lesser marginal scales. The principal marginal scales are twenty in number. There is one in the middle line behind and one in the middle line in front. The scales are in the main quadrilateral, the outer edges being straight; but there is a certain tendency to become pentagonal in front. The posterior nine are larger than the others, and their inner edges are obliquely bevelled off. The median scales are altogether ten in number; four succeed each other in the middle line, from before backwards, without interruption; and two similarly occupy the anterior portion of the space between the principal marginal scales: but a pair of scales meet in the middle line between the first and last-mentioned series; and another pair of scales are placed between the third and fourth, counting from behind forwards, and the marginal scales. The hindermost median scale is rounded behind and at the sides, and has a straight anterior margin. The second is nearly square, inclining to be hexagonal. The third is nearly triangular, and the fourth lozenge-shaped. The surface of these median scales is much more distinctly granulated than that of the posterior marginal scales. The secondary lateral scutes are small, and skirt the anterior third of the lateral edges of the shield. There are five on the right side, and four on the left; they are longer than they are deep, and are moderately smooth on the surface [1].

Scapular Shield.—The scapular shield has seven complete transverse rows of scutes. The first anterior row fringes the margins of the anterior aperture of the shield, which has the form of an arch 2·3 inches high and 1·8 wide. The second row from the front runs strictly parallel with the first. The third row is parallel with the second. In the fourth row the middle plate is thrown a little backwards by the meeting of the next two plates in front by it; and the lateral portions of this fourth row are separated from the third at the sides by the intercalation of four incomplete rows between the fourth and the third. The fifth row meets the fourth at the margin; but between the margin and centre there

[1] I find Burmeister has given a description of the cephalic shield of our species, of which the following is my translation:—"Among the true Armadillos, the Mataco (*Tolypeutes conurus*) has the cephalic shield very similar to that of the *Panochthus* by the corresponding differences of the plates of which it is composed. In the Mataco of our collection the vertical shield is a prolonged oval, with an acute margin, black as far as that; and in front the sides are rounded. It is composed of two large central symmetrical plates at the top, one behind the other, and in front of these continued by a pair of symmetrical plates between the eyes, and, furthermore, four symmetrical ones in single file down towards the nares. In the circumference of the central group there are nine plates, on each side of which the last four occipital ones have the margins acute and projecting. Besides there are five very diminutive orbital plates over each eye, and four, a little larger, on each side anterior to the eyes forwards towards the nares. In all, there are forty-four plates in the head-shield, which is $2\frac{3}{4}$ inches long and $1\frac{1}{2}$ inch wide at its posterior part. All the other species of *Dasypus* have a vertical shield less regular and not so systematic in composition as the Mataco, and cannot be so well compared to that of *Panochthus*, which has been described."—*Anales del Museo Publico de Buenos Aires*, 1871, tom. ii. p. 117.

is an intercalated incomplete row. The sixth row meets the fifth at the margin, but there is an intercalated incomplete row at the side. The seventh and hindermost row is parallel and contiguous with the sixth throughout.

There are twenty-three scutes in the first, and twenty-nine in the seventh row.

The scutes of the first row are granulated on the surface, with bevelled and acute free edges, and quadrate or pentagonal in contour. The other scutes are quadrate, pentagonal, or hexagonal. Those of the seventh, in the middle line especially, are considerably longer than they are broad.

The edges of the scutes which form the lateral margin of the shield are straight and bevelled off, without projecting points. Here and there short hairs project from the hinder edges of the scutes; but this is more especially at the sides, the hairs being very few and short or absent on the middle part of the shield.

Movable Zones.—The scapular shield fits loosely from side to side, although its parts are firmly united together. It is connected by a fold of soft and flexible integument with the anterior edge of the three movable zones; and these zones are similarly united with one another, and with the anterior margin of the pelvic shield.

The folds of skin are so disposed that each movable part overlaps that which lies behind it. There are twenty-five scales in the first movable zone, and there are twenty-seven in each of the others. The middle scales in each row are oblong, and 0·9 inch long by 0·5 inch wide. They diminish in length at the sides, and lessen in width. The two terminal ones differ from the others in being more nearly square, in having their posterior edges nearly free, and in being devoid of sculpture on their exterior. The lower scute of the second is almost triangular; and a flat brush of long hairs projects from the free margin of the integument beneath it; but these terminal scutes are not recurved or pointed.

The total length of the middle scute of the anterior zone is 1·6 of an inch; and of this 0·75 of an inch is covered by the scapular shield.

Pelvic Shield.—The pelvic shield is shaped like a quarter of an egg, the small end being posterior. It is very convex from side to side, and also from before backwards in tho middle line of the back. It presents fifteen complete transverse rows of scutes, extending right across the shield from one margin to the other. These scutes are for the most part hexagonal and granular upon the surface. The marginal scutes have bevelled edges; but only a few of those of the hindermost row present any points. They are tuberculated on the surface, except those on the margin; and the tuberculation has often a rosette-like pattern.

The fifteen rows of scutes are all parallel, and in contact with one another, except the middle portions of the fourteenth and fifteenth, between which is left a triangular space occupied by one central scute, surrounded by seven others.

The number of scutes in the fifteenth row is about thirteen. In the most anterior row there are twenty-five scutes. The marginal scutes in this front row are bent-in differently from the others, and have a certain resemblance to the corresponding scutes in the free zones.

The Tail.—The short tail is so broad and flattened at its base as to be almost triangular

in outline; it is also much flattened from above downwards at the base; but towards the extremity it is flattened in the reverse way, or from side to side.

The scales are arranged quincuncially rather than in regular zones. On the dorsal surface of the middle and basal parts of the tail there are coarse rounded tubercles, separated by widish intervals, while on the under surface and the extremity these are flattened and overlapping plates. A space on the middle and under surface of the tail, for a distance of 0·9 of an inch from the anus, is smooth and devoid of scales. At the root of the tail the scutes are so arranged as to form a kind of lateral ridges.

Numbers of Scutes.—On my examination of the carapace of *Tolypeutes*, in the first instance, I did not deem it of importance to count with precision the total number of scale-covered osseous pieces composing the cuirass. Subsequently, on studying Burmeister's masterly memoirs, I found he had computed the number of tesseræ associated in the coat of mail in some of the great fossil Glyptodonts. By this time I had cut up my three-banded Dasypode; and what with injury to the pieces, and inherent difficulty of mastering count of the smaller units of dermal armour, what I here reckon must be taken as but an approximation *pour servir*. Thus on the cephalic shield I made out some thirty on the top, and twenty of unequal sizes round the edges, or about fifty in all; on the scapular shield at least 340, whereof seventy are marginal. On the three movable zones the numbers already mentioned are equivalent to seventy-nine. The pelvic shield contains close upon, if not somewhat more than 360 pieces, including those of the ischial arches. The tail, with great and small bony scutes, has no less than 130. In rough computation, then, the total number of segments or tesseræ would be 960, or possibly even between that and 1000.

3. *Special Receptacles for Limbs and Tail.*

Chamber for withdrawal of Fore Limbs.—The outer surface of the shoulder is perfectly free, and covered with integument bearing very long brown hairs as far as the spine of the scapula, and is only then reflected on to the inner side of the scapular shield. A chamber is thus formed between the shoulder and pectoral shield, into which the fore limb can be retracted.

This chamber is bounded behind by the integument which passes from the hinder part of the thorax to the inner side of the second free zone. As already mentioned, the inner wall of this chamber is constituted by the integument of the shoulder, and is covered with very long hairs, between two and three inches in length, which proceed from the edges of the oval horny scales of 0″·15 magnitude. In this respect the inner wall of the chamber presents a striking contrast to the outer wall, which is almost smooth. It has but a few such scales scattered here and there until towards its convex part, where there are some three or four rows of small horny plates, forming a kind of continuation of the horny plates of the proper scapular shield (*vide* fig. 8).

The inner and outer surfaces of the fore limbs and the thorax, the front part of the abdomen, the inner and under surfaces of the hind limbs, are covered with long hairs and more or less distinct scales. The root of the penis and circumference of anus, however, are almost free from these appendages; and upon the penis itself the loose and rugous integument is devoid of hair or scales.

Isthmus of Skinfolds.—That which in the table of measurements is spoken of as the isthmus, is a fold of integument which passes obliquely, like a kind of diaphragm, from the region of the penultimate and antepenultimate rib to the first, second, and third movable zones and the pelvic shield. This fold of integument forms the front wall of a chamber which reaches to the middle line of the back above, in the dorsal and lumbar regions, and to the summit of the ilium at the point of junction with the carapace. It is bounded behind by the junction of the ischium with an inward process of the pelvic shield; and by the last-named structures it is separated from the caudal chamber.

Chamber for withdrawal of Hind Limbs.—Just as the inner wall of the chamber for the anterior limb was formed for the shoulder, so this chamber for the posterior limb is bounded internally by the posterior wall of the thorax, the lateral walls of the abdomen, and the lateral walls of the pelvic region. This inner boundary is not nearly so hairy as in the case of the anterior chamber, there being far fewer scales and only shorter and scantier hairs. The inner lining of the outer wall, formed by the integument of the pelvic shield, appears to be absolutely smooth, except towards the lower aperture of the chamber, where a few scales extend upwards in continuation of the pelvic shield.

Tail-chamber.—Between the two last-mentioned chambers on each side there is a sort of chamber for the root of the tail, bounded at the sides by the integument covering the conjoined ischii and process of pelvic shield, and above by the termination of the pelvic shield, which forms a kind of arch 1″·3 wide. Longish hairs fringe the integument where it passes from the underside to the lateral boundaries of this chamber.

4. *Tegumentary Aspect of Head and Feet.*

Skin of Head.—The integument of the head beneath the shield has no bony scutes under the eye or elsewhere. On the snout the hairs are short and scanty for the most part; but upon the sides of the cheeks, lower jaw, and partly gular region, there is a great number of small bony plates, with thin convex borders, which project forwards; and from these long brown hairs proceed. The extremity of the snout, between the nostrils, is smooth and bald. The nostrils themselves are completely terminal, and the septum narium is only 0″·07 at its narrowest. Each nostril is about 0″·7 wide, and is almost divided into two passages by a fold of integument proceeding from the outer wall of the nose downwards and inwards.

The Ear.—The concha of the ear is very remarkable, forming a kind of funnel, the margins of which naturally fold upon themselves along a line directed from above obliquely downwards and forwards. The concha thus comes to have an anterior lobe or division and a posterior lobe. The anterior lobe is not quite as broad as the posterior one when the two are folded together, the latter overlapping it by 0″·16. When the two lobes of the ear are completely spread out, it presents an oval expansion, the margin of which is slightly notched at the two lines of folding. The proper aperture of the meatus auditorius lies between the anterior and posterior folds, and is a narrow elongated slit about 0″·2 in length. The posterior lip of this slit rises into an undulating ridge, which is continued down to the lower margin of the posterior lobe. The anterior lip is

similarly produced into a ridge, which curves round the upper curvature of the latter, and dies away upon the posterior lobe at the base of a small elongated elevation. In front of this ridge, upon the lower half of the anterior lobe, there is a longitudinal ridge, and above it and disconnected from it on the same side, a smaller one. When the two lobes of the ear are folded together, the ridges which have been described interlock. The outer surface of the lobe is covered by numerous minute horny scales, which horny scales are continued all round the margins of both lobes, and on the inner surface of each lobe as far as the ridges, where they die away. From the outer surface of the posterior lobe these scales are far more scanty than from that of the anterior lobe. A fold of integument extends from the zygoma, just behind the eye, to the under surface of the anterior row of scapular scales, and connects the sides of the head and neck with the scapular shield.

Feet.—The fore foot exhibits only three toes [1]. Of these three toes the innermost is the longest, irrespectively of the claw; but the middle toe is by far the stoutest. The middle and inner toes are connected together as far as the root of the claw by a web-like membrane, and the outer toe is similarly enclosed to the base of the claw.

The nails are all convex forwards on their dorsal surface, and deeply grooved on the palmar surface.

The innermost nail is not much curved; and its inner edge is thinner and more produced than its outer edge. Its end is obtusely pointed. The middle nail is very strong, and greatly curved backwards; it is thick upon the inner side, thin and produced on its outer edge, and truncated at the extremity. The outermost nail, the smallest of all, is nearly straight. It is thicker on the inner edge, produced and thinner on the outer edge, and sharply pointed at its extremity.

There is this peculiarity to be noted, that in the fore limb the longitudinal axes of the second and fourth digits, if produced, are the axis of the claws of those digits; but that is not the case with the axis of the middle digit, which is only coincident with that of the basal half of the claw, the distal half having a gentle twist outwards.

The scales which have been mentioned as covering especially the fore and inner face of the fore limb become particularly large upon the dorsal surface of the manus, and the hairs which proceed from their inner edges are very long. Three such scales lie on the inner side of the innermost digit; but there is no trace externally of a pollex or of the little digit. The palmar surface is covered by a bald and wrinkled integument, on which there are no callosities.

The hind limb is exceedingly different from the fore limb. It presents three broad truncated nails, that of the middle digit being broadest and most convex from before backwards, while two smaller and pointed nails correspond to the hallux and little digit. The anterior portion of the sole of the foot corresponding with the undersurface of the three middle digits forms a broad callous cushion, on which the weight of the body was

[1] Dr. Gray observes:—"The specimen living in the Gardens of the Zoological Society, I have been informed by Mr. Bartlett and Dr. Peters, has only three front claws. All those in the British Museum have four, which appears to be the normal number. In other respects the animals are similar."—P. Z. S. 1865, p. 381.

evidently supported during life. A deep fold, occupied by wrinkled integument, separates it from the hinder division of the foot, which bears the two lateral digits.

Each of these lateral digits sends in a little rounded cushion directed downwards and inwards, and which probably contributed its share in supporting the body, while the rest of the sole of the foot, as far as the heel, has a thin wrinkled integument.

Scales, with subjacent pencils of long hairs, extend over the dorsum and sides of the foot, as they do over corresponding regions of the manus.

IV. Apparatus for drawing the Body etc. together.

Muscles of Carapace and subjacent Layer.

Protractor of the Scapular Shield.—There is a broad muscle which extends from the posterior part of the zygoma and meatus auditorius (outwards and backwards when the head is protruded) to the inner surface of the second row of scutes in the pectoral shield, and spreads out over the anterior fifth and lateral part of the shield.

Contractor of the Scapular and Pelvic Shields.—The rest of the inner surface of each half of the pectoral shield is occupied by the broad and sheet-like anterior attachment of a digastric muscle. The posterior fleshy fibres of this muscle are similarly attached by a broad expansion to the inner surface of each lateral half of the pelvic shield. The two portions are connected beneath the movable zones by a flat silvery tendon, the fibres of which cross each other, the deeper ones passing in front and to the outside, backwards and inwards, while the superficial fibres take a course from the front and inside backwards and outwards. A broad aponeurotic membrane extends from the region of the hindermost ribs to the front edge of the pelvic shield and the outer edge of this membrane, which forms the basis of the partition between the anterior and posterior limb-chambers, and plays the part of a sort of pulley. I may further remark that the numerous slips which ascend from the contractor in the six-banded Armadillo, reduced to three in *Tolypeutes*, are in the latter partially separate from the great fore-and-aft plane of muscles (*vide* figs. 7 & 8).

Protractor of the First movable Zone.—A muscle arises from the edge of the anterior movable zone (its third outer scute), near the middle line, and is inserted into the anterior part of the spine of the scapula. The action of this muscle is to pull the scapula backwards; or, if the scapula is fixed, its fibres draw the anterior movable zone forwards.

Retractor of Scapular Shield.—There is a small thin sheet of muscle proceeding from the vertebral angle (antero-superior) of the scapula; and passing forwards and upwards, it is inserted into the front part of the pectoral shield at about the middle line.

These two last-mentioned muscles are both unrollers of the carapace, and they are retractors of the shield when the limb is fixed.

Panniculus Carnosus.—This is but feebly developed, and forms a layer quite beneath the preceding. It is, as usual, a broad sheet of fibres; but the fleshy constituents are very scanty, giving it more the appearance of superficial fascia, or loose fibrous tunic, than of a true muscular envelope. It is attached towards the middle line of the back

from about opposite the last two ribs, and extends to the lumbar fascia and the anterior crest of the ilium by a very delicate web of areolar tissue intermixed with tendinous fascia. This spreads out in a fan-like manner, the posterior insertion being the anterior surface of the hind limb as low down as the knee, reaching inwards, and being united with the inner edge of the flexors of the back of the leg. The anterior and abdominal insertions of the panniculus are lost in the superficial fascia and skin covering the axilla and median line of the abdomen.

The weak condition of this muscle, as also its attachments, tends to show that it enters little into the rolling-up action of the body and carapace. It rather seems to be relaxed and loose while the limbs are being drawn towards each other as they are retracted into their respective chambers.

The foregoing muscles, besides their interest as appurtenances to the mechanism whereby movement of the one portion of the carapace towards the other is effected, possess an additional interest homologically. Before collating argument thereon, I shall advert to the researches of the Italian, Prof. Alessandrini[1], as showing that in species of *Dasypus*, which have less power of rolling and unrolling themselves than *Tolypeutes*, carapace-muscles similar in kind obtain. Cuvier[2], in *D. cinctus*, has more particularly illustrated the subjacent sheet, or what more commonly goes by the name of panniculus carnosus. In *Chlamydophorus truncatus*, Hyrtl[3] fully notices the distribution of the latter, and expresses absence of the shield-contractor, so conspicuous in other genera of the loricate Dasypodes.

By way of comparison I select the Apteryx and the Hedgehog, for these reasons, that they equally have marked and well-defined cutaneous muscles, and that Owen and Cuvier's terms are distinct, though evidently applied to homologous structures in the classes Aves and Mammalia.

In the Apteryx[4] our English anatomist defines:—1, a constrictor colli, situate at the upper back part of neck, with chiefly transverse fibres; 2, sterno-cervicalis, enclasping

[1] "Structura integumentorum Armadilli," in Nov. Comm. Acad. Bonon. 1849. I would, however, more particularly refer to his monograph in the Mem. Accad. d. Sci. Bologna, tom. vii. 1856, "Cenni sull' Anatomia del Dasipo minimo, Desmarest, *Dasypus sexcinctus et octodecimcinctus*, Linn." In this, tab. 13. fig. 1, he demonstrates the inner muscular layer of the dorso-lumbar scutes with its offshoots to the movable zones. I append part of his description of the same, inverting the order of his two paragraphs, that the main muscle (= the bellies of my contractor of the scapular and pelvic shields) may take precedence.

"*lm*, largo musculo che, verso la regione dorsale, attraversa tutte le zone mobili, ed in parte ancora le vicine degli scudi immobili anteriore e posteriore, sui quali anzi fissandosi, può condurre ora anteriormente ora posteriormente le zone stesse, e facilitare ancora la flessione laterale del tronco. *e*, *f*, *g*, *h*, *i*, *k*, sei striscie muscolari, che nella regione superiore attraversano lo spazio, chiuso da integumenti molli, interposto alle singole zone mobili, manifestamente destinate alla adduzione delle zone stesse. Le quattro striscie anteriori hanno la medesima estensione, ma le due posteriori sono più brevi."—*L. c.* p. 329.

I may here note that Rapp ('Edentaten,' 2nd ed. p. 65) uses the term *musculi loricæ intrinseci* for the above; and in allusion to its use in rolling up the body, refers to the observations of the Prince Maximilian von Neuwied, 'Beiträge zur Naturgeschichte von Brasilien,' vol. ii. p. 534, as somewhat opposed to Alessandrini's inferences.

[2] Recueil de Planches de Myologie, pl. 259. fig. 1.

[3] Denksch. d. K. Akad. d. Wissensch. Wien, vol. ix. 1855, p. 29.

[4] Trans. Zool. Soc. vol. iii. p. 278.

the lower nuchal region; 3, sterno-maxillaris, almost like an anterior continuation of the last mentioned; 4, dermo-transversalis, oblique upper postnuchal fibres; 5, platysma myoides, with a gular distribution; 6, dermo-spinalis, from the three foremost dorsal spines to the scapular region; 7, dermo-iliacus, between iliac and scapular regions. 8, dermo-costalis, joins the preceding, and comes from the seventh and eighth costal appendages; 9, dermo-ulnaris, from the last to back of elbow-joint; 10, dermo-humeralis, abdomen to humerus.

Cuvier's lettering and nomenclature[1] of the skin-muscles of mammalia runs:—1, fronto-occipital (occipito-frontien); 1*a*, sourciliers (fronto-sourciliers); 2, facien; 3, cervico-facien; 3*a*, dorso-occipitien; 4, thoraco-facien; 5, dermo-humérien; 5*a*, portion scapulaire; 5*b*, portion dorsale; 5*c*, portion latérale; 5*d*, portion ventrale; 5*e*, dermo-coccygien. Excepting 3*a*, muscules or muscular slips corresponding to the abov are shown in his dissection of *Erinaceus* (Myologie, pls. lxxiv. and lxxv.). The names of themselves sufficiently denote their situation. I may as well note that in the same savant's drawings of *Dasypus sexcinctus* (*l. c.* pl. cclix.) nos. 3*a*, 4, 5, and 5*c*, are lettered accordingly.

Having in view, then, the determination of what cutaneous muscles obtain in the Three-banded Armadillo, as indicated by those of the struthious bird and the Insectivore, I think we may correlate what has been denominated protractor of the scapular shield with Cuvier's facien, cervico-facien, and thoraco-facien divisions, and partially with the so-called sterno-cervicalis and sterno-maxillaris of *Apteryx*. The protractor of the first movable zone appears to be homologous with the dermo-transversalis and dermo-spinalis in the bird, and with the scapulaire portion of the dermo-humérien in the mammal; it agrees also with Cuvier's "acromio-maxillaire."[2] In the same way the retractor of the scapular shield in *Tolypeutes* most nearly corresponds with "la portion dorsale du dermo-humérien," though evidently also combining regionally and functionally the avine and mammalian slips named in the preceding sentence. After what has been said, there is a difficulty in ascribing the precise counterparts of the digitations to the movable zon es though these may bear a relation to exuberant quill-slips—to Owen's dermo-costalis, or offshoots of Cuvier's p. latérale; at all events the zonal digitations ("striscie muscolari" of Alessandrini) in *Dasypus sexcinctus* are the counterpart of the fascicles in *Tolypeutes*. With regard to the contractor of the scapulo-pelvic shields, it undoubtedly coincides, in its action, situation, and true homology, with the orbicular muscle of some authors in the Hedgehog, with Cuvier's main "portion latérale des muscles peauciers" in the same animal; and it moreover may include or be bound up with his "dermo-coccygien." In some respects it answers to Owen's "dermo-iliacus" in the Apteryx, the dermo-costalis being related thereto. Respecting the deeper envelope of feeble panniculus carnosus in the Mataco, its throat-area, the strips to the fore limbs, the belly part, and that to the groins agree in most particulars with what, in the struthious form, is specified as platysma myoides, constrictor colli, dermo-ulnaris, and dermo-humeralis; it also pertains distinctly to the "portion ventrale, latérale, dermo-humérien, thoraco-facien," &c. in the Insectivore.

[1] 'Myologie,' and 'Leçons,' 2nd ed. tom. iii. p. 594.

[2] Leçons, iii. p. 606.

The hinge of generalization unfolding the homologies and significance of this pseudo-complex system of cutaneous muscles, I believe, turns on the fact that the whole belongs to a single or partially double fleshy envelope, the panniculus carnosus. In some cases this is most expansively distributed, in others reduced to a minimum. In one group of vertebrates a limited portion alone may be well developed, which portion, on the contrary, is feebly represented, but not utterly absent, in another series of forms. Occasionally the fleshy fibres are very thick within a circumscribed area, and serve a special purpose in the animal's economy. Again, even when moderate in quantity, a set of fibres, by attachment or otherwise, may acquire prominence, and receive a name accordingly. Equally in Mammalia, Aves, and some Reptilia, superficial fasciculi, few or numerous, emerge from the main mass, and act separately or in combination with the diffused sheet, as erectors &c. of the tegumentary coverings and appendages. On the other hand, deep-placed bundles, sparse or abundant, interblend with the subjacent muscles and fasciæ of the head, body, and limbs. Although generally recognized, and differently named, from position, course of the fibres, or functional aptitude, the so-called individual muscles of this harmonious fleshy cutaneous tunic thoroughly decussate the one with the other. In this respect, therefore, the whole may appropriately be considered in unity; for it is only very exceptionally that belly and tendon are present, or clear lines of demarcation other than devious direction of fibres obtain. It is foreign to the purport of the present paper to support the foregoing broad assertion by amplitude of proof. The subject of itself is most interesting in a variety of ways; and towards its elucidation I trust ere long I shall find an opportunity of throwing together my notes and reflections thereon in the form of a separate paper. In the present instance of *Tolypeutes* I have distinguished by names afresh, as applied to their actions, the several muscular slips of shields and zones, desiring thereby to accentuate their uses rather than suppress them in a homological cloak.

V. The Viscera.

1. *Contents of the Abdomen.*

Relative Position of the Abdominal Viscera.—The unusually large liver occupies the left as well as the right hypochondrium; and its left lobe also lies completely in front of the stomach.

The cardiac end of the stomach occupies comparatively a small space behind the liver; and between the greater curvature of the stomach and the enlarged left kidney is the spleen, consisting of three lobes, viz. a short curved lobe, turned towards the dorsal side, a long anterior lobe, and shorter lobe, placed posteriorly. The lesser omentum, which connects the spleen with the cardiac end of the stomach, passes from the middle of the inner surface of the spleen, and leaves the extremities of the lobes free. The great omentum is continuous with the lesser, and passes off from the greater curvature of the stomach its whole length. Its front layer is continued back on to the duodenum, and then is reflected upwards and backwards, forming a distinct omental pouch or sac. The

foramen of Winslow is of a moderate size, and lies between the duodenum and the free inner margin of the right half of the liver.

These parts, the left lobe of the liver, the stomach, the spleen, the left kidney, and part of the intestines, occupy the whole of the left half of the abdominal cavity. The right half of the cavity contains, in front, the middle lobe of the liver, and, behind, the chief portion of the convolutions of the intestines, and deeper the right and caudate lobes of the liver, with the right kidney.

As soon as the œsophagus has passed through the diaphragmatic aperture and entered the abdominal cavity, it receives an investment of peritonæum. This, the gastro-hepatic omentum &c., is adherent to the œsophagus and cardiac end of stomach; and its layers, uniting on the opposite side, form a sort of of mesogastrium, which fixes the lower end of the œsophagus and cardiac end of stomach to the spine.

The stomach itself I shall further make allusion to, but here note that the duodenum passes at once to the right side of the spine, and then turns backwards alongside of the vertebral column. It then goes to the upper and posterior part of the brim of the pelvis, and is there fixed by peritonæum. Transferring our description of the visceral attachments to the rectum, I may observe that this is very wide. It passes up the middle line of the vertebral column as far as the pyloric end of the stomach, where, becoming a truly large intestine, it makes a loop, passes over to the right side of the spine, and bends back to near the level of the upper end of the right kidney. It then is flexed upon itself forwards, and, suddenly narrowing, passes into small intestine without forming a diverticular cæcum. The part of it which arches across, obviously corresponds to the transverse colon, and is bound to the vertebral column by a comparatively small mesocolon. The mesocolon is continuous backwards with the mesentery, which extends as far as the brim of the pelvis. The mesentery stretches to the right side of the body; and to the greater part of its broad plaited margin the several coils of the small intestine are fastened. The last one and a half inch of the great intestine is, properly speaking, contained in the commencement of the mesentery.

To a most serviceable description and figures of the viscera separately, Alessandrini[1] has superadded a ventral view of the opened body, with organs *in situ* of an adult male *D. sexcinctus*, and of a full-grown ♀ fœtus of *D. 9-cinctus*. In both the exposed portion of the liver is much greater than in the present (fig. 10, Pl. XXIII.), and, on the contrary, the stomach and greater intestine occupy a less prominent position. The said relative disposition does not altogether agree with what I have met with in dissections of the same species; albeit in them the great breadth and fulness of the anterior mass of the liver is considerable. Hyrtl's figure[2] of the eviscerated parts of *Chlamydophorus* supports in resemblances Alessandrini's delineations.

Stomach, Intestines, &c.—The gastric organ is pear-shaped, the elongate pyloric extremity narrowing into the duodenum. The cardiac end is somewhat dilated; and the gullet enters about the middle of the viscus. The rough measurements of the stomach, when distended, are $1\frac{1}{4}$ in short, and $2\frac{1}{4}$ inches in long diameter. The wall of

[1] Memoir, 1856, already referred to, pl. xii. & pl. xvii. fig. 2.

[2] Tab. v. fig. 1 of his Monograph, p. 45.

the cardiac division is thin, that of the pyloric end thicker. The inner coat of the former is almost wanting in permanent rugæ superiorly, but inferiorly and in the pyloric end they are well marked, though not very numerous. Some three or four narrow, forked, but sweeping folds exist within the surface of the lesser curvature and right moiety of the posterior wall, reaching from the œsophageal aperture towards the pylorus. Several others of a similar kind well nigh at right angles to the former, floor the great curvature. The thickening of the pyloric parietes is due to increase of the submucous and muscular coats, besides the additional free mucous folds. To the naked eye the mucous membrane appears almost smooth; but with a hand-lens many apertures of gastric glands are visible; and between the latter the character is finely villous.

The small intestines are 52 inches long, and with a nearly uniform diameter of about $\frac{1}{4}$ of an inch thoughout. A fair-sized Peyer's patch lies within a $\frac{1}{4}$ of an inch of the pylorus; and others are met with at wide intervals. Valvulæ conniventes are wanting. A nipple-like process, 1 inch from the pyloric ring, marks the aperture of the pancreatic and common bile-duct. There is no cæcal diverticulum, nor ileo-cæcal valve. The division between ileum and colon is indicated by an enlargement of the latter. Near its commencement, where widest, this simple colon is no more than an inch in diameter; and it narrows steadily for a distance of 5 inches or more, the last 3 inches (or what corresponds to rectum) again widening. The entire length of the great gut is $9\frac{1}{3}$ inches.

In the stomach being less round, the œsophagus more to the right, absence of pyloric division, no valvular protuberance (although the pylorus is thick, and orifice narrow), *Tolypeutes* coincides with the six-banded species of *Dasypus* and *Chlamydophorus*, and not with the Peba (*Tatusia*). But in deficiency of a pair of short cæcal appendages it agrees with the latter, and differs from the two former[1]. Again, the gut is altogether very much shorter than in either genera compared.

The thick bifid spleen, with free limbs of unequal length, is firmly adherent, by a short gastro-splenic omentum, to the lower left end of the stomach. It is less than a couple of inches in extreme length. Owen[2] mentions that this organ is broader and flatter in *D. sexcinctus* than in *D.* (*Tatusia*) *peba*; and in the former he observed that "a small supernumerary spleen was lodged in the head of the pancreas." In my own dissections of these animals, with slight difference of size, no variation obtained from *Tolypeutes*.

The pancreas is also thickish, but flat, nodulated, and $1\frac{1}{2}$ in. in diameter.

Mesenteric glands are numerous, the most common size and shape resembling a split lentil, here and there several being aggregated in a semicontinuous mass.

Liver.—This organ proportionally is of enormous volume, occupying, as said, the whole of the left hypochondrium, and on the right side descending as far as the summit of the right kidney. The falciform ligament divides the liver into right and left moieties, of which the right is fully as big as the left, viz. as 3 to 2. The left moiety is divided by a

[1] Consult respectively Owen, P. Z. S. 1831, pp. 143–155; Rapp, 'Die Edentaten,' 2nd ed. p. 76 &c., tab. viii. fig. 1; Alessandrini, Cenni, *l. c.* 1856, p. 295, pl. xvi. figs. 5–7, and pl. xvii. fig. 3 &c.; Hyrtl, *l. c.* p. 47, pls. v., vi.

[2] *Loc. cit.* p. 157.

deep fissure, extending from the front surface of the liver obliquely inwards and backwards to near the middle of its posterior surface, into two lobes, an inner and an outer (4 and 5, fig. 11), of which the inner is by far the smaller. The right moiety is divided by two externally deep fissures, which extend from the convex anterior and outer surface of the liver nearly to its posterior face, into three lobes—an anterior, a middle, and a posterior (3, 2, 1, fig. 11). The anterior of these is the smallest; and its convex anterior face is marked by a deep groove, which extends towards the middle line, and ends towards the falciform ligament. The under surface of this lobe carries the gall-bladder, which is elongated, straight, and fusiform, and half sunk in a deep fossa. On the left this lobe is bounded by the median fissure, posteriorly by the transverse fissure, into which the vessels enter as usual. The space or region of the under surface of this lobe, between the gall-bladder and median fissure, answers to the *lobus quadratus*. The part which might be regarded as the *lobus Spigelii* is prolonged backwards, and passes into the other two divisions of the right moiety of the liver. The posterior surface of the second of these (1, fig. 11) is concave, and exactly receives the convexity of the kidney. After having been thoroughly soaked in spirits, and therefore much contracted, I noted that the left lobe (No. 5) measured 2 inches by $1\frac{1}{4}$ across. No. 4 was less, and No. 3 above an inch in diameter. Nos. 2 and 1 were each about a couple of inches long and from 1 to $1\frac{1}{2}$ inch at widest.

The right coronary ligament is connected with the posterior superior angle of this division, and passes thence to the spine, and is continued upwards by the side of the spine to the diaphragm.

The free edge of the falciform ligament extends from the notch which divides the right and left halves of the organ to the under surface of the xiphoid process. The ligament itself passes back along the under surface of the diaphragm on the one hand and the front surface of the liver on the other, to the place of reflection of the coronary ligaments.

The left coronary ligament takes its origin opposite to the last rib, and is continued thence, presenting a free margin backwards to the left lobe of the liver, to which it is attached, about three tenths of an inch from its free margin.

In species examined by myself—among others the Weasel-headed Armadillo, *D. 6-cinctus* (=*D. encoubert*)[1], the Peludo or the Hairy Armadillo, *Euphractus villosus*, the Pichy or Little Armadillo, *Euphractus* (=*Dasypus*) *minutus*, and Cachiame, *D.* (*Tatusia*) *peba*—the liver is essentially identical with that of *Tolypeutes* in the number and general disposition of the lobes &c. But there is this difference, that the latter peculiar genus has a larger mass on the right side drawn out posteriorly and covered by gut—a condition or variation, possibly an adjustment, reconcilable with its remarkable power of body-flexion. The Pichiciago (*Chlamydophorus*) has a liver, in divisions and general figure, most nearly agreeing with the commoner Armadillos than with the Mataco.

Kidneys.—The situation of these has been incidentally mentioned in the relative position of the viscera. The left one had such a remarkably rotund appearance, and so

[1] See Alessandrini, *l. c.* fig. 6, tab. 14 &c.; likewise Cuvier's remarks, 'Leçons,' tom. iv. pt. ii. p. 460.

filled the deep lumbar cavity, that at first sight I was inclined to regard it as a great tumour, which further examination and its structure quickly dispelled. It was 1·35 inch long and 1·1 inch thick. The dimensions of the right renal organ were somewhat under this, and it reached a trifle further backwards, the area in advance being partially occupied by the middle, right, and caudate lobes of the liver. The capsule of the kidney is strong, and in this case was very firmly bound to the lumbar peritonæum, and with little or no fatty envelope. In a transverse section displaying the sinus &c., the infundibula are seen to be few but deep.

Alessandrini affirms he found traces of lobulation in the kidneys of fœtal Armadilloes, instancing *D. novemcinctus*[1] (*Tatusia peba*?). In the numerous examples of the group examined by myself, adolescent or adult, the surface has been smooth and without indication of lobular sulci. In all, the shape and position is similar to the above, any difference rather depending on the configuration of the bones and fleshy bed than in the glands themselves.

Each suprarenal body caps the rotund kidney, and thence lies close and firmly against the side of the spine. Its figure is trihedral, ½ an inch in diameter and flattish.

Genitalia.—In the Armadilloes the male intromittent organ is long, but in *Tolypeutes* inordinately so. In the flaccid condition it is more than one-third the entire length of the animal (*vide* table of measurements, *anteà* p. 74); consequently, when erect, it must exceed this. Such great antediluvian Loricate forms as the Glyptodons (*Hoplophorus*, *Panochthus*, &c.) must needs, therefore, have been provided with amazing genitalia. Did the same proportion obtain, say, in Cetacea, which also have a conical penis; then in the larger species this organ would attain a magnitude of between 20 and 30 feet—a thing monstrous and absurd. Owen[2] suggests of the penis of the Armadillo, that it "has a disproportionate length in relation to the mechanical obstacles to coition presented by the body-armour."

Tolypeutes, in the construction of its generative parts, accords with the living genera *Dasypus* and *Tatusia*. There are a pair of Cowperian glands, in shape and size like small flattened French beans; and their ducts open in the floor at the fore part of the bulbous portion of the urethra. The prostate gland has a long diameter of about ¾ of an inch, with breadth and thickness in proportion. Its figure is somewhat quadrangular, but in this case with the left upper border defective and eccentric. The contracted small urinary bladder was more pyriform than in the dilated oval figure of that of *Dasypus* given by Professor Alessandrini[3]. I did not observe that medio-anterior termination of the urachus alluded to by Owen in *D. 6-cinctus*[4]. The urethral bulb is moderately full and roundish, the crura immensely strong for such a small animal. The pair of long retractores of the penis, the bulbo- and the ischio-cavernosus muscles, are well developed. Posteriorly the corpus spongiosum is of large calibre, and diminishes by degrees forwards, terminating thinly at the orifice of the urethra. The testes, of considerable size, as in the other Armadilloes, are lodged within the abdomen; and there is

[1] *L. c.* fig. 8, tab. 17. Hyrtl (*l. c.* fig. 5, pl. v.) shows the renal organs of *Chlamydophorus* to be non-lobulate. Anat. of Vertebrates, vol. iii. p. 658.

[2] *L. c.* tab. xiii. fig. 8.

[3] P. Z. S. 1831, p. 157.

an inguinal cremasteric band connected therewith. The superior and inferior extremities of the epididymis (globus major and minor) are each elongate and of good size. There are no vesiculæ seminales.

2. *Thoracic Parts and Midriff.*

Heart, Lungs, and Trachea.—No speciality is exhibited in the heart.

The lungs are each three-lobed. The two anterior together are about equal in dimensions to the posterior division. The middle lobe is narrow and remarkably elongate. When the lung is inflated, it meets its fellow of the opposite side, and thus they enclasp the cardiac apex. The posterior lobe, when contracted, is short—though, under other conditions, it must necessarily be considerably lengthened, and with an inward or semispiral twist behind, to fit the thoracic pocket beneath the fleshy ligamentum arcuatum and lesser muscle of the diaphragm.

I counted fifteen soft flexible rings in the trachea, from the cricoid to the bronchial fork. These do not meet behind. The tube altogether seems narrowest in the middle, and slightly wider below. Its length is 1·3 inch; and each bronchus is less than $\frac{1}{2}$ an inch.

In *Dasypus* 9-*cinctus*, according to Owen[1], Rapp[2], and Alessandrini[3], there are but two lobes to the left lung and three to the right, though the latter's figures point to an incision or semidivision of the sinistral upper lobe. The last-mentioned anatomist demonstrates quadripartition of the right lung and a trifid left lung of *D.* 6-*cinctus*; but in Owen's specimen there were three lobes on both sides. *Chlamydophorus*[4] agrees with the Peba in lung-segmentation. It has 16, the Encoubert 13, and the Peba from 18 to 22 tracheal rings.

Fleshy Septa and action of Walls of Chest.—Regarding the diaphragm, its construction and attachments, though answering to what in common obtains among the greater number of mammals, is yet worth separate mention on account of its being functionally accessory to the visceral displacement during flexion of the trunk. There is a large trefoil central tendon girdled by a fleshy plane with ordinary fastenings. The so-called ligamentum arcuatum externum and internum run together; and this backward extension of the greater muscle of the diaphragm is fleshy and not ligamentous. It extends from the last rib rearwards to the diapophyses, parapophyses, and rudimentary transverse processes of the two lumbar vertebræ behind that to which the posterior rib is partially articulated. It is also inserted upon their bodies, and, by a narrow angular union with the opposite moiety, leaves a small aortic opening. What corresponds to the lesser diaphragmatic muscle of human anatomy is thoroughly muscular in *Tolypeutes*; and it spinally mingles with the greater, as above described. Its left (and not the right) crus is best developed, and proceeds beyond the œsophageal cleft, quite up to the inferior vena cava. Indeed a few muscular fibrillæ from it even appear to encircle that vessel.

It is not a little remarkable that the representative of the quadratus lumborum muscle

[1] P. Z. S. 1831, p. 143.
[2] 'Die Edentaten,' 2nd. ed. (*D. longicaudus*), p. 96.
[3] Memoir *l. c.* p. 308, tab. xiii. fig. 7, and tab. xvi. figs. 3 & 4.
[4] Hyrtl, *l. c.* p. 45, pl. v. fig. 2.

is situated entirely within the thoracic cavity. It is recognizable in weak narrow muscular fasciculi, which lie alongside the spine and heads of the ribs, from the 8th dorsal backwards. The said fleshy part terminates in five or six semiunited, flat, weak, subequal tendons, which are inserted on the lateral surfaces of the bodies and anterior zygapophyses of the 9th, 10th, and 11th dorsals and two anterior lumbar vertebræ[1]. I may further remark in this place that although the rectus capitis anticus major does enter the chest, its volume is small and insignificant as respects power of dorso-vertebral curvature.

The series of intercostal muscles, both external (which, as usual, cease at the junction of ribs and costal cartilages) and internal, are strong; so are the levatores costarum, which are very manifest, and, indeed, all things considered, powerful to a degree. Some few fibres I differentiated are analogous to the so-called subcostal muscles of Man. The triangularis sterni is weak, and stops short of the xiphoid bone and cartilage.

I shall again have occasion to show that the chief axis of movement in the spine during the act of flexion is between the second and third lumbar vertebræ. The thorax of itself, under ordinary circumstances, has a considerable antero-posterior or spinal curvature—and when the body is bent, one well nigh equal to that of the sacral region. In this posture, moreover, the ribs are thrown widely out, particularly the five hindmost, the costal cartilages are thrust forwards and in part override, and the ensiform sternal segment, by relaxation of the abdominal muscles, yields and falls downwards. It further results that the abdominal viscera are shoved forwards; and as the lungs and heart are necessarily confined and pressed against by the liver and diaphragm, their bulk diminishes in proportion. The heart then tilts well to the left; the lungs bulge out posteriorly, so that the liver is well provided with stowage-room. Moreover it seems to me that those muscular fibres of the diaphragm which surround the inferior vena cava so compress it as to prevent the return of the blood towards the heart, the return of blood to the heart being temporarily through the superior cava.

3. *Cavity of Mouth, Laryngeal Apparatus, &c.*

Palate and Dentition.—The palate is long, narrow, and elliptical in configuration, and from anterior apex to pharyngeal arch measures $2\frac{1}{4}$ inches. Of this nearly 1 inch behind (chiefly soft palate) is smooth and flat; the remainder (hard palate) is ridged—its anterior moiety being slightly concave, the posterior moiety or mid third of the whole palatal surface having a tendency to median raphe. There are eleven distinct and one indefinite ridge. The fourth, sixth, and eighth do not arch quite across; the remainder do; and all have a more or less forward curvature.

This specimen presented no difference in its dental formula from that enunciated by

[1] With reference to the thoracic region of *Chlamydophorus truncatus*, one sentence of Hyrtl's is worthy of quotation, *l. c.* p. 33:—"*Novus columnæ vertebralis flexor.* Hunc musculum, in interno thoracis ambitu reperiundum, hic paucis adumbrare, loci magis commodi defectus imperat. Columnæ vertebrali proxime utrimque adstans, a primæ vertebræ lumbalis apophysi transversa, nervoso tendine exoritur, qui protinus carnosam induit naturam, et sex posterioribus thoracis vertebris accrescit, quarum columnam deorsum curvabit, et thoraci id erit, quod Quadratus lumborum abdomini est."

Cuvier[1] of l'Apar (three-banded species), viz. $\frac{9-9}{9-9}$, premaxillary denticles being absent. The foremost and the hindmost tooth are smaller than the intervening series, the former in the lower jaw barely protruding beyond the gum.

Glands, Tongue, and Pharynx.—By reference to the excellent plates of Wilhelm von Rapp[2] and Antonio Alessandrini[3], showing in inferior views the peculiarities of the salivary glands, and comparing these with the partial dissection in profile of our specimen (fig. 12), it is evident that their salivary apparatus closely correspond. One remarkable structure (to wit, a small sac or salivary reservoir) has been successively and independently described by Winker[4], Jäger[5], and Owen[6], in the 9-banded Armadillo. The observations of the latter on 6-cinctus, Alessandrini and myself on other genera and species, and Hyrtl[7] on the Chlamydophorus pretty well establish the fact of this salivary sacculus &c. being common to the Armadillo group. I need not, then, recapitulate diffusely: suffice it to mention that enlarged submaxillary glands reach backward almost to the sternum; several diminutive ductlets collect the secretion into the sacculus, situate under the mandibular angle, whence it is conveyed by a long duct to the symphysis menti, and there penetrates the lingual membranes. The parotid is small, has an additional *socia parotidis*; and there is a series of sublingual glandular crypts which, inside each horizontal ramus, are firmly attached to the periosteal membrane.

When within the mouth, the tongue is a couple of inches long; but it can be thrust out very considerably more. Ordinarily, from the tip to the frænum it measures 1 inch. In its elongate conical shape the lingual organ is exactly like that of the other Armadilloes; and it has the same finely villous surface, which seems almost smooth to the eye. There are also a pair of fossulate papillæ on the dorsum near the root[8].

The muscles composing and acting upon the tongue seem to be a modification of what Owen describes in the Great Anteater[9], the decussation of fibres and constituent layers being less complicate. I could not differentiate what he denotes sternoglossi, but in their place observed that the relatively voluminous sternohyoidei and sternothyroidei were closely incorporated and sprung broadly from the inner surface of the manubrium. An imperfect division forwards is attached to the thyroid cartilage, representative therefore of sternothyroid. The uppermost layer goes to the hyoid bone (= sternohyoid), is fastened to the front and sides of the anchylosed basi- and thyrohyals. Moreover the

[1] 'Ossemens Fossiles,' 3rd ed. tome v. p. 123.

[2] *Op. cit.* tab. vii.

[3] *L. c.* tab. xii. & tab. xvii. figs. 2, 3.

[4] 'Dissert. sistens observ. anat. de Tatu novem-cincto,' Tübing. 1824, p. 10.

[5] Quoted by Rapp. The original paper I have not seen.

[6] P. Z. S. 1831, pp. 144 & 157; also fig. 303, and redescrip. of saliv. appar. in Armadillo, p. 400, vol. iii. Anat. of Verteb.

[7] Monog. p. 42, tab. v. fig. 3.

[8] Further consult authorities already mentioned. Truthfully delineated by Alessandrini in *D. 6-cinctus*, fig. 6, tab. xiii., and *D. 9-cinctus*, fig. 6, tab. xvi.

[9] Trans. Zool. Soc. vol. iv. p. 125. Of the muscles of the mandibular and hyoid arches and tongue the following are figured and dilated upon:—Mylohyoideus (quadripartite), constrictor salivaris, ceratohyoideus, stylohyoideus, geniohyoideus, sternothyroidei, cricothyroidei, thyrohyoidei, intercornualis, sternoglossus, genioglossus (complex), epihyoglossi, hyo-epiglottideus, constrictores pharyngis (=ceratopharyngeus, epipharyngeus, hyopharyngeus, thyropharyngeus, cricopharyngeus), retractor pharyngis, and dermal and facial muscles generally.

muscle does not appear to stop here, but is continued superficially on to the under surface of the tongue, and, without any precise line of definition, merges into what I take to be the mylohyoid. Still more deeply short fasciculi are inserted on the nodular ceratohyals, and partially to the extrinsic lingual muscles at the inferior root.

The mylohyoidei have no mesial raphe, but together form a long, flat, narrow, tapering plane, fixed to the lower inner margin of each half of the horizontal mandibular ramus, and posteriorly attached to the hyoid, being continuous, as above said, with the sternohyoidei. Beneath the preceding are two long narrow bands, with symphysial and hyoidean attachments, to wit, the geniohyoidei. The pair of hyoglossus muscles do not meet in the middle line, and posteriorly are affixed to the ceratohyals. The geniohyoglossi are very characteristic and structurally compound. Rearwards their internal portions are fastened to the basihyal between the geniohyoidei; and their exterior more to the epihyals. Each styloglossus is a weak and narrow slip, situate in front of the hypoglossal nerve, and from the cranial origin of the stylohyal proceeds forwards and joins the hyoglossus muscle outside and opposite the dovetailing of the geniohyoglossus. A narrow weak slip, representative of stylohyoid, and a better-marked broader stylopharyngeus are readily distinguished. The constrictores and other pharyngeal muscles I did not follow with desirable accuracy.

The isthmus and pillars of the fauces are well defined; and from the prominence of the middle and two lateral glosso-epiglottic membranous folds a pair of fair-sized fossæ obtain at the rear of the tongue. The small tonsils are very distinct, each, however, being hidden in a faucial recess, the fore part of which they occupy. The velum pendulum palati is worthy of the name, as it constitutes a wide-arched curtain, which in the usual contracted condition reduces the pharyngeal passage to an opening $\frac{1}{10}$ of an inch in diameter. When looked at from the front (see sketch, fig. 19), this narrow aperture appears split in two by the epiglottic septum, and superiorly is overhung by a relatively large and thick uvula.

A second sketch, also of natural size, which I have shown in fig. 20, displays the pharyngeal cavity, the soft palate being divided and thrown back. In this the three frænula, or glosso-epiglottic folds, are brought into relief, as are a couple of depressions between them and the epiglottis. The pharyngeal cavity is of a good size, its membranous walls only of moderate thickness and thrown into a few lateral parallel folds below. On each side of the larynx is an external laryngeal fossa, deepish elliptical-shaped and 0·2 inch long. Although the mucous surface is somewhat smooth, it is plentifully supplied with glands.

The œsophagus is some $2\frac{1}{2}$ inches long, and rather wide, its fleshy coat being well developed. Superiorly there are several longitudinal narrow plicæ; but inferiorly its inner lining is smoother. Here and there, especially towards the pharyngeal extremity, are small raised seed-shaped glands; but besides these, and distributed everywhere, are minute orifices or glandular puncta.

Hyoid and Larynx.—The thyro- and basihyals are bony, firmly anchylosed together, and with an anterior mesial carina. Each osseous moiety is 0·4 inch long. Laterally it exhibits a widish spear-shaped plate, with deepish and wide basal emarginations.

The middle keeled basal division has a superior articular prominence for the attachment of the ceratohyal, and below is produced into a broadish terminally blunt (barely bifid) apex. The depth of the hyoid at its carinal aspect is 0·25 inch. The ceratohyal is a small nodule of bone, with bursal and a free fibroid connexion with the basi-, thyro-, and epihyal. The latter bone is stoutish and 0·3 inch long. The stylohyal is slenderer and fully longer, its cranial end being tipped with a short cartilage.

As respects the larynx, it is composed of very soft flexible cartilaginous material, a restricted narrow triangular area at the *pomum adami* and inferior margins of the wings alone showing ossific deposit. The thyroid alæ are inflated and rounded, with a pronounced middle antero-inferior widish cleft. Superior and inferior cornua are short. In front the cricothyroid membrane and space are large and transversely diamond-shaped. The cricoid cartilage forms a complete ring, and anteriorly presents considerable depth. Posteriorly it has a broad and somewhat chevron-shaped outline, with a central most unusually prominent ridge. Besides, the lateral edges are also much raised, leaving a deep depression for the cricoarytenoid muscles. The triangular arytenoid cartilages are flat but fair-sized; and from their anterior apex is a small cartilaginous offshoot, answering either to the cartilage of Santorini or Wrisberg [1]. The epiglottis is a wide and large leaflet, very soft and flexible, and apically slightly notched [2]. The fissure of the rima glottidis is 0·2 inch long, narrowed behind; and there is an absence of pouching in the interior of the larynx.

The variation of figure &c. of the larynx in *Dasypus* and *Tatusia* is but slight, the depth and fulness of the thyroid and cricoid cartilages being, mayhap, relatively greater. Hyrtl (*l. c.* tab. vi. fig. 5), in a magnified view, shows by a section the inner laryngeal aspect of *Chlamydophorus*, and in his text refers to the vocal cords &c., obviously not unlike the same in *Tolypeutes*.

Among the muscles attached to the foregoing parts, the thyrohyoidei are well developed; and there are fair and clearly differentiated representatives of cricothyroidei, posterior cricoarytænoidei, and arytæno-epiglottidei, with normal attachments. Others doubtless are present, but less appreciable from their small size.

4. *Vaso-Nervous Arrangements.*

Vessels.—I distinguished but a single vena cava descendens and one ascendens.

The arch of the aorta, as Owen[3] observes of *Dasypus* (*Tatusia*) *peba*, splits into main trunks precisely as in the human subject—*i. e.* a short innominate, wherefrom a right subclavian and common carotid are derived, the left carotid and subclavian arteries issuing separately from the arch.

[1] Alessandrini remarks, "Le cartilagini accessorie del Santorini e del Wrisberg mancano interamente, circostanza avvertita anche dal più volte lodato De Rapp, asserendo in genere che negli Armadilli l'organo descritto è piuttosto semplice" (*l. c.* p. 308).

[2] Owen states that in *D. 9-cinctus* the epiglottis projects through the arch of the soft palate (P. Z. S. 1831, p. 144). Under certain conditions such may take place; but certainly it was not found so in my dissection of *Tolypeutes*.

[3] P. Z. S. 1831, p. 143.

The subclavians pass over the broad first rib in a groove immediately in front of the axillary plexus of nerves. The brachial artery accompanies the median nerve through the supracondyloid foramen, as Wenzel Gruber [1] has already recorded in *Dasypus tricinctus*.

At the intervertebral line marking junction of the last lumbar and first sacral vertebra, the abdominal aorta sends off on either side an artery equivalent to the external iliac. This passes to the inside of the process of the sacro-iliac synchondrosis, and, reaching the pelvic basin, proceeds to the middle of the groin, becoming the femoral. In its course it lies upon the tiny tendons of the psoas parvus, afterwards obliquely crosses the psoas iliacus and gracilis ere reaching the adductors &c. About a quarter of an inch below the origin of the external iliacs, another pair of arteries, internal iliacs, spring from the stem of the aorta abdominalis. Each of these dips behind the deep pelvic muscle, reenters the pelvis at the sacrococcygeus: gluteal and other branches were not followed.

As I did not dissect in detail the peripheral vascular subdivisions, I am unable to say if *Tolypeutes* presents the retial peculiarities offered by the six-banded Armadillo, to which attention has been directed by Profs. Allman [2], Rapp [3], and others [4]. My rapid examination, however, seems to point out that its arterial distribution is of the type prevalent amongst other loricate edentates, not excepting the curious *Chlamydophorus* [5].

Brain.—As regards the brain, I carefully extracted this and placed it in spirits; but unfortunately an accident befell the specimen ere I was prepared to figure and describe it. This is to be regretted, as hitherto it has not been investigated. The deficiency has to some extent been temporarily supplied by Professor Gervais [6] in a sketch of a cast of the cerebral cavity of *Tolypeutes tricinctus*. He remarks, "L'Apar a les lobes olfactifs encore plus gros, surtout plus larges et déjà séparés de la partie antérieure des hémisphères par une sorte de collet; ses hémisphères sont allongés, à plis également rares; son cervelet est plus large et moins long."

Judging from Gervais's illustrations, it presents in contour closest agreement with *Euphractus* (*Dasypus*) *sexcinctus*, somewhat less with *E. villosus* (=*D. vellerosus*, Gray), and still less with *Priodontes gigas*. The accuracy of Gervais's figure and his remarks are substantiated in my outline of the interior basis cranii, Plate 26, where, moreover, the large maxillary and frontal sinuses have been opened up.

Figures of the brain of *Dasypus peba*, given by Rapp [7] and Alessandrini [8], and of *Dasypus sexcinctus* by Turner [9], seem to confirm the above statement.

The Nerves.—Ramifications of these were traced in a fugitive manner. There is a relatively voluminous bundle of infra-orbital nerves, important in connexion with the naso-labial parts. Many of the twigs lie between and underneath the upper and lower levatores muscles. The facial nerve is likewise large, and, emerging from the upper part

[1] Mém. d. l'Acad. d. Sci. d. St. Pétersb. 1867, tom. x. [2] Trans. Brit. Assoc. 1843, p. 68. [3] *Op. cit.* p. 92.

[4] "Das arterielle Gefässsystem der Edentaten," Hyrtl, Denksch. Akad. d. Wiss. Wien, 1849. Milne-Edwards, Physiol. et Anat. Comp. tom. iii. p. 544, where, besides a discussion on retia generally, copious references to the literature will be found.

[5] Hyrtl, monog. on *Chlamydophorus* cited.

[6] "Les formes cérébrales des Édentés," Nouv. Archives du Muséum, 1869, tom. v. p. 41, pl. ii. fig. 8.

[7] *Op. cit.* tab. viii. fig. 3. [8] Memoir *l. c.* tab. xvii. fig. 9. [9] Journ. of Anat. 1867, vol. i. p. 31.

of the parotid gland, crosses the masseter about its middle. The hypoglossal nerve goes in front of the stylohyoid muscle, and enters the root of the tongue, where the hyoglossus and geniohyoglossus muscles meet. The lingual nerve pursues its course in advance of the hypoglossal.

Notwithstanding abbreviation and thorough anchylosis of some of the neck-vertebræ, the ordinary number of the cervical nerves obtains. The 1st nerve appears to issue from the foramen on the outside of the atlas, and to be distributed to the muscular tissues hard by. The 2nd, 3rd, and 4th nerves are united separately from as many foramina in the coalesced trivertebral axial division. The fourth nerve is much thicker than the two preceding; and the three together constitute the cervical plexus, the first being apart, as in *Chlamydophorus truncatus*.

The brachial plexus is formed by the 5th to 8th nerves inclusive, and a communicating branch from the fourth. The long thoracic is only partially derived from the fifth. The median and the ulnar nerves are each a thick cord; and the latter passes through the internal condyloid foramen. At the sole of the foot the radial nerve is large, intimately adherent, and partially distributed to the palmar fascia as well as muscles. The increase of neurotic power concomitant with thickness of cord doubtless contributes to and has considerable influence on the tension of the great nail-borne foot.

Of the lumbar and sacral plexus, I noted that the crural or femoral trunk came chiefly from the foramina between the second and third lumbar vertebræ, entirely posterior, therefore to the quadratus lumborum muscle, but anterior to the ilium, and outside the peculiar long lumbo-iliac (psoas) ligament. The femoral nerve lies on the surface of the ilio-psoas muscle, and, in company with but exteriorly to the femoral artery, proceeds to the groin. What answers to the obturator nerve is made up of branches from the 3rd and 4th lumbar nerves. It lies to the inside of the psoas parvus and close to the synchondrosis, passes just inside the pelvic brim, and escapes posteriorly through the obturator foramen.

The most notable of the nerves composing the sacral plexus are those constituting the ischiatic—the remaining posterior branches being diminutive, covered by and supplying the infracaudal muscles. The pair of largest cords contributing to the great sciatic emerge from the foramina just within the pelvic basin.

VI. Myology.

In comparing the muscular structure of the present form with others of the Armadillo tribe, I shall have occasion more especially to cite the annexed authorities, with recourse now and again to writings on allied Edentata &c. in illustration of points at issue.

1. 'Recueil de Planches de Myologie,' Cuvier et Laurillard, "Tatou à six bandes," pls. 259, 260.

2. 'Hunterian Lectures' by Huxley, 1865. Abstract Med. Times and Gaz. His MS. of Lects. 8 & 9, however, containing notes of dissection of *Dasypus 6-cinctus*, he has kindly placed at my disposal.

3. "The Muscles of the Fore and Hind Limb in *D. 6-cinctus*," Galton, Trans. Linn. Soc. vol. xxvi.

4. References to muscular anat. of several Armadilloes, in Macalister's paper on *Bradypus*, Ann. and Mag. Nat. Hist. vol. iv. 1869.

5. "Caput tertium, MYOLOGIA," Hyrtl's "*Chlamydophori truncati* cum *Dasypode gymnuro* comp.," Denksch. d. k. Akad. d. Wissensch. in Wien, 1855, vol. ix. pls. i. to vi.

1. *Muscles of the Hind Quarters.*

In *Tolypeutes* the musculo-aponeurotic strip of the tensor vaginæ femoris answers tolerably well to the clear description given of it by Mr. Galton in *Dasypus*, save the sixth dorsal band. It assists in drawing the femur forwards, upwards, and slightly inwards, the main fixed points being the anterior iliac spine and front of third trochanter. In the attitude of walking it is partially hidden by the gluteus maximus.

The muscular fibres of the gluteus maximus are thin, the strongest being situate superiorly and posteriorly, whilst the interspace between great and third trochanter comprises only transparent fascia. By tendinous fasciculi it stretches from the anterior crest or spine of ilium along the dorsum of the sacrum to where the pelvic shield joins the ischial tuberosity (*i. e.* the osseous arch), and with an attachment to that bone. Its tendinous sheet of insertion upon the third trochanter encloses that process as a semilune. The anterior fascia unites with that of the tensor vaginæ femoris, the aponeurosis of the two passing on to the surface of the vastus externus as low even as the outer condyles and the patella, while the posterior part of its tendinous fascia runs well into the anterior edge of the biceps femoris muscle.

Its actions are chiefly an anterior and posterior movement, together with a semi-rotatory motion and abduction of the limb from the side of the body.

Similar to the above in other Armadilloes—though, in the Pichiciago, Hyrtl[1] speaks of as if composed of three portions.

The gluteus medius and minimus are inseparably united, and of a somewhat rhomboidal form. They have origin from the superior scooped surface of the prismatic-shaped ilium, and are inserted into the whole of the upper border of the great trochanter. They together are much stronger and fleshy than the gluteus maximus; and the anterior edge and upper surface of their origin is tendinous superficially. From the direction of their fibres a power of drawing the head of the limb forwards and inwards is indicated.

Galton[2] seems to think the gluteus minimus is absent in the 6-banded species, though other writers[3] aver confluence with the gluteus medius.

Beneath the preceding, as in *Dasypus*, there is a narrower elongate triangular muscle, which, I agree with Galton, represents a pyriformis. It springs from the side of the sacrum, at the large ovoid ilio-sacral space (= great sciatic foramen), and trending rearwards is inserted by a stout tendon into the posterior upper border of the great trochanter. The thick cord of the sciatic nerve runs beneath it.

Behind the last a pair of feeble gemelli obtain. The anterior comes from the surface

[1] *L. c.* p. 30. "Portio tertia, omnium maxima, non solum ad dictum trochanterem terminatur, sed per omnem spinæ, ab hoc trochantere ad condylum usque externum continuatæ, longitudinem diffunditur."

[2] *L. c.* p. 550.

[3] Cuvier's a^1, fig. 3; Hyrtl, p. 39.

of the bone immediately behind the sacro-sciatic space; the posterior is implanted rather on a small nodosity of the ischium above the obturator foramen. Neither reaches upwards to the sacrum; and both pretty well conjoined are inserted by a short tendon behind the trochanteric fossa.

Close to, but further back than, the gemelli is a longish goodly-sized quadratus femoris. This springs from the vertical plate of the ischium in front of its tuberosity, and descends to the third trochanter. The sciatic nerve goes beneath it, but superficial to the gemelli, thus dipping between the two.

I distinguish, under the temporary name of *ischio-femoral*, a long, narrow, fleshy band on the same plane as the quadratus femoris, but its origin placed considerably behind it and converging below. It lies and crosses obliquely the surface of the biceps femoris, springs from the ischial tuberosity and partly, by extension of fascial tendon, from the arch of the pelvic shield. Inferiorly it is inserted on the third trochanter behind and somewhat lower than the quadratus femoris.

None of the authors quoted mentions this extra muscle, unless it be included in their bicipital divisions. I apprehend avine and reptilian characters in it, inasmuch as in some birds there is a somewhat similarly situate muscular strip, which passes from the side of the tail to the middle of the femur. In the kingfishers I name this "caudo-femoral." Mr. Mivart[1] describes and figures in the *Iguana tuberculata* an accessory muscle, designated ilio-peroneal, and another as femoro-caudal. The latter nearly corresponds with that of *Tolypeutes*, though agreeing more with my caudo-femoral in the bird. As regards the gemelli and quadratus femoris in *Dasypus* and *Chalmydophorus*, these in the main coincide with the condition extant in the three-banded Armadillo.

According to my reading, the biceps femoris in *Tolypeutes* has but a single head of origin, viz. from the tuberosity of the ischium and the side of the bone in advance of that process. The anterior moiety of origin is strongly tendinous. The fleshy fibres forming the belly of the muscle broaden out as they descend; and some proceed nearly to the middle of the fibula. The insertion, however, is an extensive aponeurotic fascia, which, partly wrapping round the limb behind, stretches from above the outer femoral condyle down to patella, head of tibia, and the fibula as far as the malleolus and even the os calcis, being attached to the latter by rather a strong tendon.

Cuvier's drawing, fig. 2, *q*, denotes greater fulness of this muscle, but no counter-indication of duality—in this, therefore, agreeing with Huxley's observation and singleness of its origin in the same species, *D. 6-cinctus*. Galton (*l. c.* p. 554), however, looks upon it as made up of two distinct factors. His anterior division is in some respects suggestive of my ischio-femoral slip; but it includes considerably more, as its main part terminates by fascia heelwards. His second, postero-superior division, with origin from ischial tuberosity, he mentions has connexion above with the gluteus maximus, and below with the gastrocnemius. *Chlamydophorus* has a biceps essentially, as I have above described, Hyrtl (*l. c.* p. 40) even grouping the next pair of muscles along with it *en masse*.

The very long semitendinosus springs chiefly by thin fascia from the postero-outer surface of the ischium, close to the lower roughening of the arch; and its insertion is about

[1] P. Z. S. 1867, pp. 789–794, figs. 15, 16, 17, 18.

the middle of the inner edge of the tibial shaft, by a broad, thin, but nevertheless strong aponeurosis, common to it, the semimembranosus, and gracilis. The semimembranosus is broader, but equally thin at its ischial origin, which is before and beneath that of the semitendinosus, but behind those of the adductor magnus and quadratus femoris. Its fibres narrow and thicken towards the insertion, which is by a very strong round tendon upon the inner side of the neck of the tibia. This tendon is hidden by the fibrous sheath of insertion of the gracilis muscle.

These two muscles, semitendinosus and semimembranosus, act in producing flexion of the lower leg; and they, along with the biceps, also cause a withdrawal of the leg into the abdominal chamber, by the direction of their forces being altered through the partially fixed aponeurosis of the latter muscle at the popliteal space.

The gracilis arises from the junction of the ischium with the pubis, also along the symphysis and nearly the whole length of the pubic brim of the pelvis. It is broad above, with thin fleshy fibres; below, its aponeurotic insertion into the tibia is extensive, mingling, as aforesaid, with that of the semitendinosus.

The letters *r*, *s*, *u* in the illustrations in the 'Recueil,' and Galton's description, show absolute identity of the three last-mentioned muscles in *Dasypus*.

The rectus femoris is tolerably well developed. It has a very strong tendon of origin from the superior [inferior] spinous process of the ilium; and there is a second head, faintly indicated by a diminutive slip of fleshy fibres, situate towards the acetabulum. Its patellar insertion is separate, and in front of those of the vasti muscles. Of the vastus externus and internus, the former is much the larger and stronger. Its muscular fibres fill the interspace between the base of the great and the anterior free edge of the third trochanter. The fleshy fasciculi of the vastus internus interweave with those of the vastus externus in front. Crureus absent, or is not to be differentiated from the vasti. In *D. 6-cinctus*, according to Galton, the rectus division of the quadriceps extensor has but a single point of origin, the vasti agree with those of *Tolypeutes*, and there is no distinct crureus, as is the case in *Chlamydophorus*.

Hyrtl, in his myology of the last-mentioned animal, the 'Pichiciago' of the Chilian Indians, alludes to the sartorius muscle in these terms:—"Sartorius insolita plane excellit origine, dum non ab ossis ilei spina, sed a tendine psoico enascitur. Proceram et macilentam sistit fasciolam, quæ cum adductorum insertione femorali decussatur, et ad internam articulationis genu regionem delabitur, ubi cum adductorum tendine robusto, ad tibiam pergente, coalescit" (*l. c.* p. 39). The editors of the posthumous 'Planches de Myologie' have, in the right groin of the animal, figured in pl. 260 and lettered a muscle "*l*, couturier, iléo-prétibien" (= sartorius), which appears to come from about the middle of Poupart's ligament, descending towards the inner aspect of the knee. In Galton's dissection of the same species of *Dasypus*, a description of a delicate sartorius is given (*l. c.* p. 553). This arises from the outer edge of the psoas parvus tendon, diagonally traverses the thigh to the fascia on the inner face of the knee and leg. He regards its action as equivalent to a kind of "tensor fasciæ femoris internus," the origin being unique. Notice is taken by him of the diversity of opinion between Meckel[1] and the editors

[1] Anat. Comp. vol. vi. p. 399 (French ed.).

of Cuvier's 'Leçons'[1], of the abnormal position of the sartorius in the Aï (*Bradypus*), which Macalister[2] afterwards decides in favour of the great German anatomist. In *Tolypeutes*, a small abnormally attached sartorius, I believe, does exist, although in my notes of the dissection I appear partially to have confounded it with the tensor vaginæ femoris.

There is, however, a very apparent though small pectineus, spoken of by Hyrtl in the *Chlamydophorus* and Galton in the 6-banded Armadillo—in this case springing from the pubic rod in front of the ilio-pectineal eminence, and passing towards the root of the inner trochanter.

Adductores.—Instead of there being only a single adductor muscle, as interpreted by Galton in *Dasypus 6-cinctus* and depicted by Cuvier and himself, I find there are at least three, if not a fourth division, in *Tolypeutes*; and a many-headed adductor obtains in *Chlamydophorus*. That which I take to be an adductor magnus, as in Man, converges in two planes, and is relatively large and strong. It has origin from the whole of the front of the upward (horizontal) and descending pubic rami, and from the ischial surface around the posterior border of the obturator foramen. By its insertion, the posterior and somewhat flattened superficies of the femoral shaft, from third trochanter to both outer and inner condyles, is occupied. The muscle answering to adductor longus is smaller than the preceding. It springs in close relation with it above and on the upper (outer) end of the horizontal ramus of the pubis, and inferiorly it is fixed to the posterior surface of the lesser (tibial) trochanter. The adductor brevis at the pelvis comes from the outside of adductor longus, and it goes to the inner edge of the femoral shaft below the tibial trochanter as far as midway between it and the inner condyle. There is, moreover, an additional slip of fleshy fibres lying beneath the two last-mentioned muscles. This has an origin betwixt them, and is inserted upon the sharp inner edge of the lesser trochanter.

I defer notice of the obturatores until mentioning the inner pelvic and subcaudal muscles.

The tibialis anticus has a broad origin from the whole of the outer surface of the tibia (excepting just above the malleolus), also from the interosseous membrane. Its tendon is inserted upon the entocuneiform, but not to the metatarsal. In *D. sexcinctus* Galton[3] mentions it as likewise possessing a considerable fibular origin; but he, Huxley[4], and Macalister[5] agree as to a single inferior tendon; so does Hyrtl[6], in the *Chlamydophorus*, "ossi naviculari insertum."

An extensor longus hallucis is wanting. It is present[7], though small, in the last-mentioned animal and in the six-banded Armadillo. In the first an external malleolar, and in the second a fibular origin is assigned it.

[1] (2nd ed.) vol. i. p. 519.
[2] Ann. & Mag. N. H. 1869, vol. iv. p. 64.
[3] Paper quoted p. 558.
[4] MS. Hunterian Lectures, 1865.
[5] Ann. & Mag. N. H. 1869, vol. iv. p. 65.
[6] *L. c.* p. 40.
[7] Recorded by Huxley and Galton; termed extensor proprius hallucis by the latter (*l. c.* p. 562); apparently the same lettered ζ^1, fig. 2, pl. 259, 'Planches de Myologie'=long extenseur du pouce (peronée-sus-onguier); it is the ext. hal. proprius of Hyrtl and Macalister.

The extensor longus digitorum is equal in bulk to the tibialis anticus. Its origin is from between the heads of the tibia and fibula, and from the anterior edge of the shaft of this latter bone for half its length. The muscular belly divides into three nearly equal-sized tendons above the malleolus, whereof the outermost of these divisions bifurcates and sends slips to the fourth and fifth digits, the fourth being the longest of the two. The middle tendon goes singly and broadly to the fourth digit. The innermost tendon divides in the middle of the dorsum, and sends two broad and flat slips to the second and third digits.

This muscle in the Encoubert, according to Huxley[1], divides but into a pair of main tendons, the fibular division as above, the tibial splitting and supplying 2nd, 3rd, and 4th toes. In Galton's[2] dissection a treble division existed. The middle tendon was joined by the outer slips of the extensor brevis, then parted into two, terminating in 4th and 3rd digits; the inner tibial tendon was joined by the median short extensor muscle, subdivided into two, but ended with tripartite tendon on the back of the 3rd and 2nd toes. Moreover there was a fibrous junction of the latter with the tendon of the extensor proprius hallucis. Divided into four tendons, going to as many outer digits in the *Chlamydophorus*.

The extensor brevis digitorum is composed of a few fleshy fibres, which come from the outer malleolus, the external lateral ligament, and the anterior upper edge of the os calcis. The fibres divide into two separate slips, ending in thin tendons, which join beneath those of the long extensor, going to the 2nd and 4th digits. From the slip joining the 2nd digit a very minute secondary slip of muscle, ending in a still finer tendon, could be traced coming from it, and, mingling, was lost in the long tendon of the 3rd digit. I observed a small sesamoid bone in the latter tendon at the joint. Huxley's and Galton's observations and Cuvier's illustration (fig. 2 ζ) of *D. 6-cinctus* nearly coincide, the fleshy e. b. d. being somewhat trifid, and joining the tendons of the long extensor as above mentioned. Hyrtl alludes to quadruple tendons in *C. truncatus* and the Dasypodes.

Peronei.—Comparatively weak in muscular fibre; the p. longus has origin from the fibula, the anterior surface of its head and upper fourth of the shaft of the fibula. Its tendon commences at the middle of the leg, glides under the outer malleolus, and proceeds deeply across the foot to the proximal ends of the 2nd and 1st metatarsals[3]. The p. brevis is much larger than the preceding both in belly and tendon. It springs from the upper half of the outer and slightly backward aspect of the fibula, the strong external ligament separating it and the peroneus longus above. It has superficial tendinous fibres in nearly the whole of its belly; but the real tendon commences about the upper end of the lower third of the fibula, passes in company with the tendon of the p. longus in the groove below the outer malleolus, and is inserted into the outer side of the distal end of the fourth metacarpal bone. Besides the foregoing, I made out by careful mani-

[1] *Loc. cit.*

[2] *L. c.* p. 560, pl. 44. fig. 5.

[3] Galton makes mention of an additional patellar origin in *D. 6-cinctus*, and follows in detail the relations of the plantar tendon finally ending in the hallucial metatarsal, *l. c.* p. 559.

pulation the presence of a peroneus tertius and p. quinti digiti. They are very delicate, but nevertheless clearly appreciable. They arise by sparse muscular fibres from the outer posterior surface of the external lateral ligament of the knee-joint, appearing continuous with the p. brevis. Their fine tendons continue downwards along with that of the p. brevis, and, after passing the outer malleolus, continue along the outside of the foot.

A p. longus, p. brevis, and p. quinti digiti have been alluded to in the Armadillo by Huxley and Macalister. Galton (p. 559) more specifically describes a p. longus and pp. brevis and tertius in the *D. sexcinctus*. The two latter are united above, have femoral, patellar, and fibular attachments: the tendon, which terminates under the 5th metatarsal, he ascribes to p. brevis; the other, which is inserted outside the proximal phalanx of the same digit, he regards as that of p. tertius. Hyrtl assigns a p. longus and p. brevis to *Chlamydophorus* (*l. c.* p. 42).

There are two heads, as usual, to the gastrocnemius; and its insertion below is the os calcis. This muscle is of considerable size, and offers no variation in other Armadilloes, though, by including the soleus, Macalister makes it appear as three-headed (*l. c.* p. 65).

The plantaris arises along with, but beneath, the external head of origin of the gastrocnemius. It has a strong muscular belly, but is so incorporated with the gastrocnemius as to be with difficulty separated until, becoming tendinous, about halfway down the leg. Its tendon, a long round one, passes to the inner side, and is inserted into the os calcis, the plantar fascia not being a continuation of it as in *Dasypus sexcinctus*. The largest of the three muscles of the calf is the soleus. It is fleshy for the whole length of the fibula and head, some of its fibres, the deepest, reaching the os calcis; and these are tendinous superficially. The soleus is in apposition deeply with the combined flexors (f. com. and f. long. hallucis), which lie to its inner side. It is similar in the 6-banded Armadillo; and Hyrtl notes in *C. truncatus* four plantar fascicular fasciæ proceeding to the sole of the foot, aiding the long digital flexores (*l. c.* 41).

In *Tolypeutes* the superficial plantar fascia is strong, and has attachment to the os calcis and inner malleolus. It entirely covers the sole, being firmly adherent to the plantar sesamoid bone and vessels, as also the tendons of the deep flexors. It sends slips more or less to all the digits; the second and third only are perforated. In *D. 6-cinctus* the plantar fascia, a continuation of the plantaris muscle, has a trifid division on the sole, the hallux and 2nd and 3rd digits being acted on by its tubular prolongations.

In relation to the other muscles of the calf of the leg, the popliteus is large. At the usual origin on the outer femoral condyle there is a small sesamoid bone. The insertion of the popliteus is continued nearly halfway down the inner posterior aspect of the tibia. Although Mr. Galton speaks of a double head to this muscle in the 6-banded Armadillo, as does Hyrtl, in *Chlamydophorus*, neither makes allusion to its containing a sesamoid; and Macalister distinctly avers there is none in *Dasypus*.

Flexor longus hallucis and flexor communis digitorum are conjoined. Their fleshy belly, of moderate bulk, occupies the whole of the posterior surface of the interosseous membrane, and about the middle fourth of the shaft of the tibia. Together the muscles form a strong tendon, a little above the malleolus. This lies in the deep groove of the

lower part of the tibia, and continues on to the sole, broadening out as it is transformed into a thick solid sesamoid ossicle. The ossicle is 0·25 inch long, nearly flat, or but very slightly rounded on the surface, but wedge-shaped deeply, and with a bursa between it and the tarsal bones. From the distal end of the plantar bone five tendons, placed semicircularly, arise; they go to the 1st, 2nd, 3rd, 4th, and 5th digits respectively. Excepting the fifth, which is a small one, they are very broad and strong, and each has small sesamoidei previous to insertion.

With the exception of an extensive fibular origin, this long compound flexor has essentially a similar arrangement in *Dasypus* 6-*cinctus* (Huxley, MS. notes, and Galton, *l. c.* p. 557). Hyrtl (in mem. cited, p. 41) takes cognizance of the plantar ossicle and connexion with long digital flexors in *D. setosus* (=the 6-banded species), in *D. novemcinctus* (=*Tatusia peba*), and in *D. gymnurus* (=*Xenurus unicinctus*), remarking of *Chlamydophorus* that it possesses a trihedral cartilaginous nodule in place of the bone, the distal tendons, however, being five in number.

In the hind foot of this specimen of *Tolypeutes conurus* there were three lumbricales:—the first from the superficial and ulnar side of the second tendon of the flexor longus, and which is inserted into the fibular side of the same digit; the second lumbricalis springs from between the second and third tendons, and is inserted upon the ulnar side of the third digit; the third lumbrical belly arose from between the third and fourth flexor tendons, and it ended upon the fibular side of the third digit.

In his account of the anatomy of the six-banded Armadillo, Prof. Huxley[1] stated he met with six lumbricales in the left foot:—one to the fibular side of the hallux; one to the tibial side of the second toe, and another to its fibular side; one to the tibial side of the third digit; one to the tibial side of the fourth toe; and, lastly, one to the tibial side of the fifth toe. In the right foot of the same animal there were seven lumbricales in all, the additional one going to the fibular side of the fourth toe. Mr. Galton[2] recounts having found seven lumbricales, with an arrangement corresponding to the right foot in Huxley's specimen. Cuvier's drawing, pl. 260, does not justify conclusions therefrom; and Hyrtl, while admitting plantar lumbricales in the curious Chilian Pichiciago, leaves their number and insertions untold.

The tibialis posticus has origin by a somewhat laterally compressed aponeurotic tendon from the head of the fibula, and by fleshy fibres from the back of the shaft of the tibia to the inner side and below the popliteus, as far as the upper end of the lower fourth of the shaft. Its tendon, rather a strong one, glides in a separate groove behind the inner malleolus, passes beneath the internal lateral ligament, and is inserted into the internal cuneiform bone. The small extra tibialis posticus of Owen is also present. This arises perfectly separate from the last, viz. from the inner malleolus, as a slight muscular slip, and it is inserted into the extra free portion of bone at the proximal end of the hallux.

The presence of a double tibialis posticus among the Dasypodidæ would seem rather to be the rule than the exception. Owen[3], as above hinted, distinctly notes its having been met

[1] MS. notes of Hunterian lectures, 1865. [2] *l. c.* p. 563. [3] P. Z. S. 1832, p. 138.

with by him in *D. 6-cinctus*; it was alluded to by Huxley[1] as a differentiated muscle going to the sesamoid. Galton[2], in the same species of Armadillo, very clearly describes the relations, course, and insertions of the compound tibialis posticus, and observes, "May not the latter of the two muscles described above be regarded as a "*tibialis posticus secundus vel internus*?" He also takes notice of the fact that in Cuvier's 'Myologie'[3] the last differentiated slip is lettered as tibialis posticus and its companion as flexor longus posticus. A second tibialis posticus obtains in *Chlamydophorus*[4], the two-toed Sloth[5], the *Ornithorhynchus*[6], several other vertebrates, and occasionally, as an abnormality, in Man[7].

2. *Inner Lumbo-pelvic, Caudal, and Belly-muscles.*

In an earlier section, *anteà* p. 90, I have drawn attention to the small quadratus lumborum as being quite within the cavity of the chest, a trace of its tendons only emerging beyond the diaphragmatic crura. Psoas muscles, again, are so aborted as to leave the lumbar region meagrely clothed, indeed almost fleshless, a perfect contrast therefore to what obtains in some of the Marsupialia, Carnivora, and Rodentia. This one might not be prepared to find; for from the remarkable facility with which *Tolypeutes* curves the body and again unrolls it, the supposition that the loin-muscles would take an active share therein seems plausible. But, on the other hand, our animal and the Armadilloes generally have but feeble saltatory power and habit[8]; and, as has been shown in the three-banded species at least, the great digastric muscle expanded within the carapace seems to supplant lumbar contractile effort. But, looking to adaptation of parts, the absence of fleshy masses within the loins serves well the economy of *Tolypeutes*; for greater space results, conducing to the neat packing of the abdominal viscera during the curvature of the body.

Psoas ligament.—I apply this term to a well-marked and unusual ligament, in some measure almost taking the place of psoas muscles. Somewhat like a backward continuation of the quadratus lumborum, or, indeed, rather simulating a rearward extension of the crural tendons of the diaphragm, there is beneath and on each side of the bodies of the posterior loin-vertebræ a stout tendon which proceeds towards the pelvic brim. Anteriorly this springs from or is firmly fastened to a ventral carinal process of the second lumbar vertebra, and therefrom, with a slightly outward divergent course, is continued to and inserted on a small eminence answering to the anterior inferior spinous process of the ilium in human anatomy. The psoas ligament is about $1\frac{1}{2}$ inch long, narrow, flat, and glistening, and at its pelvic termination partly covers and mingles with the superficial facial structures of the sacro-iliac synchondrosis. It appears to have an important bearing in spinal flexion, forasmuch as the hinge of movement at the loins turns on a pivot at the intervertebral cartilage between the second and third lumbar vertebræ. Thus its office may be compared to a guy-rope steadying and partially regulating the curvilinear tension of the pelvic parts to the spine in advance.

[1] Hunterian Lectures, 1865. [2] *L. c.* p. 558. [3] Pl. 260.

[4] Hyrtl's Monograph on its Anatomy, *l. c.* p. 41.

[5] Galton "On the Myology of *Cyclothurus didactylus*," Ann. & Mag. Nat. Hist. Oct. 1869.

[6] Meckel's Anat. Comp. French ed. vol. vi. p. 424, and his memoir '*Ornithorhynchi paradoxi* Descript. Anat.'

[7] See Wood's Remark, Proc. Roy. Soc. vol. xiv. p. 389.

[8] Witness Prof. Owen's remarks on the movements of the living Armadillo. P. Z. S. 1832, p. 135.

What has been denominated psoas ligament, may be critically considered by others the homologue of a psoas parvus muscle. It certainly is altogether devoid of fleshy fibre; and, moreover, there is an additional factor suggestive of the latter. This, for contrast, then, I shall regard as psoas parvus. It is a tiny slip posteriorly inside the so-called ligament, and composed of slender fleshy fasciculi coming from the sides of the third and fourth lumbar vertebræ, and inserted by a delicate tendon on the inner aspect of the ilium, just below the last.

The muscle answering to the ilio-psoas of Galton and psoadiliacus of Macalister is clearly of a compound character in *Tolypeutes*. That moiety which best answers to a psoas magnus covers the ventral surface of the ilium by a layer of flesh, and is inserted by a strong tendon on the upper point of the lesser femoral trochanter. The narrower outer segment, or iliacus, springs more from the edge of the bone, and descending alongside the first, in close proximity to it and the rectus femoris, is muscularly fastened in front of the lesser trochanter below the femoral neck.

An obturator internus is said to be wanting in *Dasypus*[1] and *Chlamydophorus*[2]; but in *Tolypeutes* a thin fleshy sheet covering the interior surface of the ischium around the obturator is evidently the muscle in question, in spite of the difficulty raised, viz. ossification and obliteration of the lesser sciatic notch. There obtains likewise a well-developed obturator externus agreeing pretty well with that of *Dasypus* (Galton), and not so bound up with the gemelli &c. as in *Chlamydophorus* (Hyrtl).

I have already made my remarks on the pyriformis, and here, along with the obturators, specify an anomalous sacro-pelvic muscle. It may be (and this is not improbable) a deep layer or division of the pyriformis. In this case it is so distinctive that I class it separately among the inner pelvic muscles, and append the cognomen of *oblique sacral* to it, the rather to mark its presence than denote its importance. Its origin is from the pelvic surface of the narrower portion of the sacrum, and in a broad fleshy layer fills up the great sacrosciatic space. Its posterior border impinges upon upon the infracaudal, the sacrococcygeus, and the obturator internus. The sacrosciatic nerve escapes at its fore border and lies on its dorsal surface, separating it therefore from that previously described as a pyriformis. Its fibres and those of the latter do not coincide in direction, but pass at an acute angle to each other.

This oblique sacral certainly does not belong to the category of the ordinary caudal muscles, neither does it answer to the obturator tertius met with by Mivart and myself in *Hyrax capensis*[3]. Without being absolutely identical, it best harmonizes with the coccygeus of human anatomy, and partially with the same muscle in the *Hyrax*.

Depressores caudæ.—Of these, three pairs are easily made out, their fleshy bellies being fully developed though flat. That to which the name infracoccygeus or infracaudal is applicable covers the mesial line of the sacrum posterior to its narrowing at the sciatic space; the middle sacral artery runs between the muscles of opposite sides. The muscle does not become tendinous until reaching the chevron bones, thence proceeds within the mail-clad tail for about half its length.

[1] Trans. Linn. Soc. vol. xxvi. p. 551 and Ann. & Mag. N. H. 1869, vol. iv. p. 63.
[2] Hyrtl, *l. c.* p. 39.
[3] P. Z. S. 1865, p. 346, figs. 9, 10.

The sacrococcygeus, lying outside, has a broader origin, which does not extend so far forwards as the last. Its caudal tendons, one to each vertebral element, are most delicate towards the end of the tail, yet tough and the reverse of weak.

The third, a short fleshy muscle, is covered almost entirely by the sacrococcygeus. It answers partly to the ischiococcygeus of some mammals and birds. Of a widish triangular shape, apex behind, it is spread out on the ischium inwards from below the neighbourhood of the tuberosity to the outer margin of the infracoccygeus. Posteriorly it is fixed to the lower surface of the incurved arch of the pelvic shield, viz. on the rear angle of the hind-leg chamber of the carapace.

Whilst the first-mentioned pairs of muscles flex the tail itself, the third pair act on the pelvic shield, forcibly dragging it down and at the same instant forwards as the animal rolls the body together.

Levatores caudæ.—These are also three in number on each side. The levator caudæ externus and internus commence by aponeurotic fascia which lies close against the spinous edge of the sacrum, in proximity to the end of the spinalis dorsi &c. and there not readily separable. As the transverse processes of the sacrum broaden, fleshy fibre increases; and this again diminishes and separation of the caudal tendons follows, opposite the arch of the pelvic shield. The usual distribution of tail-tendons takes place within the bony tunnel (vide fig. 12, Tab. XXIV).

The lumbo-caudalis[1], a small muscle lying outside the preceding, is narrower and weaker than the ischiococcygeus. It springs from above and inside the ischial tuberosity, terminating by a partially compound tendon on the side of the root of the tail, opposite the posterior apex of the arch of the pelvic shield.

The external oblique muscle of the abdomen arises by ordinary digitations from eight or nine of the posterior ribs, the digitations however being short. It has also attachment to the whole of the last rib, the lumbar fascia, transverse processes of the loin-vertebræ, and anterior spine of the ilium. I omitted registering remarks on the internal oblique, but noted that the rectus abdominis narrowed anteriorly, and reached, but barely proceeded beyond, the xiphoid cartilage. Poupart's ligament, however, is very considerably accentuated, and conspicuously defines the rear of the abdominal parietes in the flexed condition of the hind limbs. The testes fit into the hollow just within, and seem to peer out at the abdominal ring.

3. *Cranio-facial Muscles.*

Belonging to the face I took note of the following series:—

1. The uppermost of a pair (or three?) long levators or retractors extending between orbit and snout, springs from the orbital surface of the maxillary bone by a flat fleshy belly. This develops a large tendon which proceeds straight forwards to the root of the upper narial cartilage.

2. The next, similar in character, although situate inferiorly, partially overlaps the preceding at its origin. It has somewhat more of an infraorbital and jugal attachment. At the side of the superior maxilla it splits into two, the tendons of which continue in a nearly

[1] See remarks on this muscle in the Manatee &c., Trans. Zool. Soc. vol. viii. p. 147, pl. 21.

parallel direction forwards, one being fixed to the lateral cartilage of the nostril; the other, more delicate, goes more downwards and terminates on the lowest lateral cartilage (=sesamoid ?). The terminal branches of the infraorbital nerves so intertwine with the tendons as to make the latter be mistaken for nervous cords.

3. From the infraorbital region there is a short, broadish, entirely fleshy layer, which strikes obliquely downwards towards the upper lip, near the angle of the mouth.

4. There is a long levator labii inferioris corresponding in part with the nasal retractors, but quite single and weaker than these; it blends rearwards with the fibres of the cheek-muscle or buccinator.

The orbicularis palpebrarum possesses a widish area; and intermingled with it behind is the forward extension and jugo-orbital insertion of the protractor of the first movable zone.

The buccinator is well developed, as also are the horseshoe-shaped fibres of the orbicularis oris.

As far as made out, the masseter is single, broad, and with a wide attachment to the mandibular angle.

The moderate-sized temporalis, besides a usual coronoid insertion, runs well down and outside the ascending ramus, in a groove which extends below the level of the teeth.

There are two strong fleshy pterygoidei.

I shall compare the foregoing with the admirable description and illustrations of the muscles of the nose, lips, and jaws of the Great Anteater (*Myrmecophaga jubata*[1]), given by Prof. Owen. It becomes apparent *ceteris paribus*, that our loricate specimen, in its fleshy facial development, presents a much greater likeness to the large hairy edentate than the elongate tenuous snout-formation of the latter would warrant. From this we may infer that the type is preserved, however much the contour of physiognomy is altered. As another corollary we may admit that, though narrowed and lengthened, the nasal retractores are in verity homologues of the naso-labial levatores of Man.

Owen specifies a levator nasi, the counterpart of my No. 1. His retractor anguli oris, retractor alæ nasi, and retractor labii superioris are comprised in *Tolypeutes* by the compound muscle numbered 2 above. In it a tertiary and not binary tendinous distribution may have been present, though not detected by me, the nerves, fascia, and tendons being involved together in a tough matted structure. We agree as to a retractor labii inferioris, though in the Anteater it possesses a more distinct superficial maxillary origin. What is named accessorius ad orbicularem oris by Owen, is No. 3 in *Tolypeutes*. Differences in the other muscles may be ascribed solely to the longer, shallower head of *Myrmecophaga jubata*. In *Chlamydophorus truncatus*, Hyrtl mentions (*l. c.* p. 30) the presence of levator anguli oris, zygomaticus, levator labii superioris or retractor rostri, besides the usual jaw-muscles.

4. *Muscles of the Spine, the Neck, and the Back, superficially.*

The long dorsal muscles have, on the whole, a paucity of flesh compared with the strength of their tendons.

[1] Trans. Zool. Soc. vol. iv. p. 133, pl. 39.

The sacro-lumbalis belies its name, reaching neither the sacrum nor loins. Its costal attachment is narrow and thin, covering the ribs a little way beyond their angles; it has the ordinary subsidiary tendons, the foremost being inserted into the head of the first rib. I did not make out an extension of cervicalis ascendens with clearness.

The thickest part of the longissimus dorsi is where it lies under the eave of the last three dorsal and first two lumbar metapophyses. These processes in a manner protect it; and this more fleshy part lodged in the bony groove doubtless exerts a pulley-action in the return spring of the spine from its flexed condition. As it has an insertion upon the last three cervical vertebræ, this anterior portion, which is strong, comes under the definition of transversalis cervicis, as applied to the muscle in Man and other animals.

The spinalis dorsi, though not voluminous, is certainly compact. It occupies the trough between the metapophyses and spinous processes. Immediately beneath is a very appreciable development of semispinalis. The component fascicular bundles of this cover two vertebral laminæ each, but lie well against the spines, posterior to the first dorsal. In the neck the s. colli has a flatter position. There is another fair-sized deeply placed neck-muscle outside the last, and with attachments (from cranium to last cervical) indicative of its being a complexus major. Whatever significance may be borne by the long spinal muscles in *Tolypeutes*, as regards reflection when the body is inturned, it is obvious from Hyrtl's description and Cuvier's plates that there is hardly any variation in the other Armadilloes.

Unless the part described under the cutaneous sheets may represent a cephalic end, the otherwise weakly developed trapezius has no forward or occipital extension in *Tolypeutes*. The more evident constituent of the muscle is a tenuous dorsal layer coming from the first and second, and expanding towards the sixth and seventh vertebral spines; the scapular insertion covers the triangular space of that bone. Cuvier, fig. 2, pl. 269, denotes greater expansion of the cucullaris; and Meckel's[1], Macalister's, and Galton's observations substantiate its duplicity in *Dasypus*. The latter writer, in admitting two factors="les portions occipitale et dorsale" of Cuvier, notes that the first arose from the neck for five inches behind the occiput, and without clavicular fastening was inserted along the scapular spine; the second had attachments from the third dorsal rearwards to the lumbar region. He describes (*l. c.* p. 527) moreover an "acromio-basilar" muscle, stretching from supraoccipuț to the metacromial process (Parker); this is Cuvier's "portion cervicale" of the trapezius, and also regarded as an accessory division thereof by Meckel &c. This last differentiated segment is analogous to a small roundish muscle met with by me in *Tolypeutes*. It sprang from the back of the skull, outside the rhomboideus capitis, and, running parallel with it, terminated in the said acromial projection. According to Macalister[2], in the Armadillo, with a clavicular insertion, the above acromio-basilar strip of Galton is a levator claviculæ or trachelo-acromial (omo-atlantic, *Haughton*; cervico-humeral, *Humphry*). This decision, as regards *Tolypeutes*, I might acquiesce in, a clavicular levator otherwise seemingly not being differentiated; but Galton specially distinguishes the presence of acromio-basilar and levator claviculæ in the same specimen.

[1] French trans. vol. vi. p. 222.

[2] "Myology of *Bradypus*," *l. c.* p. 52.

In *Chlamydophorus* a condition of the cucullaris similar to that in *Dasypus* obtains, as also the additional part (=acromio-basilar?). Hyrtl (*l. c.* p. 33) suggests the name of "capitis extensores" to the planes in question, and afterwards shows the rhomboidei and levator scapulæ are much as I shall describe.

Rhomboidei.—The anterior of these, that to which r. capitis[1] is applicable, springs by a strong tendon from the back of the neck, and, at first fleshy and round, thickens and broadens as it goes backwards to be fastened into the supraspinous fossa between the metacromial process and the anterior scapular angle. It lies entirely outside the insertion of the protractor of the movable zones, and in its course it crosses the spinous and other muscles of the neck. Rhomboideus major and minor are united, and at their origin (second to fifth dorsal vertebræ) they are intimately connected with the longissimus dorsi. They have an insertion upon the scapula, its surface and vertebral border of spine, except so much as is occupied by the serratus magnus.

Equally in the three- and many-banded Armadilloes and the *Chlamydophorus* there is no trace of an omohyoid.

The splenius in *Tolypeutes* is very long and narrow, but of tolerable bulk. By short tendons it springs from the second, third, and fourth dorsal spines, and by a single small but moderately strong tendon is fixed to the paramastoid (?) behind the meatus auditorius externus. Assimilation of splenius capitis and colli obtains in *Chlamydophorus*; and the next pair, as in *Tolypeutes*, are separate. There is a fulness in the first of these, the complexus major, which arises from five anterior dorsal and two or three of the posterior cervicals, being occipitally attached anteriorly; the other, complexus minor, comes from the cervical transverse processes, and cranially is lodged beneath the tendon of the splenius.

The deep, short muscles of the back of the neck are fleshy, and altogether form a defined V-shaped area between axial spine and occiput. Though partially coalesced, the usual divisions can be traced. The rectus capitis anticus major is mesially tendinous, outwardly fleshy, and with oblique fibres. Anteriorly it is adherent to the basiocciput, about the middle lies on the outer margins of the cervicals, and posteriorly enters the cavity of the chest to the third dorsal body. There is a smaller, *i. e.* r. c. a. minor, with normal attachments. A representative of longus colli reaches from the second to sixth cervicals; its inner possesses oblique, its outer moiety longitudinal fibres

Whether owing to nuchal semi-anchylosis or related to the disposition of transverse processes and considerable calibre of the cervical plexus of nerves, &c., a scalenus anticus is deficient; and what trifling development of muscle there is appears to be homologous with the s. posticus, or, mayhap, in addition, the s. medius of Man—an opinion entertained by Hyrtl (*l. c.*).

Respecting sterno-mastoid I need alone repeat the fact that the authors so often mentioned have found unanimously in genera of the Armadillo tribe separation into cleidal and sternal segments. With a greater clavicular breadth of the former, and a partial attachment of the latter to the cartilage at the sternal end of the clavicle,

[1] This is the occipito-scapular segment of Galton, Macalister, and others, and in part levator scapulæ of Hyrtl.

Galton's[1] graphic description of the condition and relations extant in *D. 6-cinctus* answer admirably to *Tolypeutes*.

The most interesting point is the Y-shaped elongation from opposite sides of the inner divisions to the xiphoid. What relation does it bear to the anomalous variety in human myology the so-called 'musculus sternalis,' 'præsternalis,' 'rectus sternalis,' 'sternalis brutorum' and 'thoracicus' of various anatomists? Professor Turner's observations[2] and historical account embrace complete argument on the question. He himself, with others, considers it a remnant of panniculus carnosus, as opposed to opinions advanced of its being an upward continuation of the rectus abdominis, a downward extension of sternomastoid, a muscle *sui generis*, or mayhap allied to the supra- or sterno-costalis. From a study of the data, I am inclined to hold a middle view. In the human subject it may retain a special name in favour of its variable nature and possible junction of two different muscles and layers. To my mind Turner's excellent delineations &c. prove that it has nothing to do with the supracostales (primus and secundus[3]), whose plane is deeper and direction of fibres nearly at right angles. Again, it cannot be confounded with rectus, since the latter, when produced to the foremost ribs (whether by aponeurosis or otherwise), passes beneath the supracostal[4]. Its transitory connexions to the pectoralis major and obliquus externus none have advocated as supporting its claim to be a production of either; nor do I think there are good grounds to justify such an assumption. It may be admitted as unique in Man, forasmuch as it frequently conjoins sternomastoid and external oblique &c.; but this by no means implies absence of its representative elements in animals. On the contrary, by its very irregularity is its composition best evinced. Where alone developed inferiorly (posteriorly, "origin" of Turner), it is a true homologue and rudiment of the panniculus ("thoracofacien" of Cuvier), as Hallet, Turner, and Galton surmise; but its superior end, in relation to sterno-mastoid, does offer similarity to the rearward prolongation of that muscle existing in *Tolypeutes* and other forms—to wit, the opinion held by Bourienne, Thiele, and Henle. The difficulty thrown out by Wilde and Turner of its lying on a plane beneath the platysma myoides strengthens rather than weakens its tegumentary character; for in many mammals (I may specify the Manatee) an almost distinct sheet of the general robe of the panniculus starts from over the sternum, passes forwards beneath the transverse platysmal fibres en route to the malar arch. The latter anatomist's cases, figs. 4, 5, and 6, are those that best uphold continuity with sternomastoid; but should it be shown hereafter that in verity, tendon or otherwise, it goes superficial to, and does not become thoroughly fused with, the manubrial extremity of the sternomastoid, then undoubtedly the musculus sternalis is none other than a remnant of the lower mammalian cutaneous sheet.

[1] *L. c.* p. 527, and "Extremities of *Orycteropus capensis*," Trans. Linn. Soc. vol. xxvi. p. 568, fig. 1, tab. 45.

[2] "On the Musculus Sternalis," Journ. of Anat. & Phys. vol. i. p. 246, pl. xii.

[3] Although the supracostal in animals is ordinarily single, yet a pair on each side are occasionally met with, witness *Lemur catta*, "Anat. of the Lemuroidea," Trans. Zool. Soc. vol. vii. p. 51, pl. iv. fig. 12.

[4] In Bourienne's solitary case mentioned in footnote p. 250 (Turner, *l. c.*), instancing continuity of rectus and sternalis, may this not have been a development of supracostal in apparent, not real, continuity with rectus?

Serrati.—The s. magnus is strong. Attachments nine anterior ribs, transverse processes of two or three postcervicals, and, as usual, scapula. There does not appear to be an s. posticus superioris; and the s. posticus inferioris might be taken for a continuation of the latissimus dorsi. It arises by fascicular tendons from the metapophyses of the last three dorsal and 1st lumbar vertebræ; and its muscular insertion is into the 3rd and 4th hindmost ribs. *Dasypus* 6-*cinctus* has a double s. magnus, one to 1st and 2nd ribs, the other to 3rd to 6th costæ (Galton); *Chlamydophorus* 8 front ribs, and united to levator scapulæ (Hyrtl).

The Latissimus dorsi and dorsi epitrochlear muscles bear intimate relations. One sheet of this associated duplex muscle is interwoven with the rhomboidei and with the posterior serratus, and comes from the 6th to 9th dorsal spines. As it winds over the posterior angle and the scapula, its fibres become distinct from those of the rhomboidei, and have an attachment to the inferior (posterior) border of the scapula, at the middle blending with the scapular head of the triceps; thence it descends to the olecranon region and fascia beyond. The second division springs fleshy from the posterior border of the scapula, in junction with the teres major; but it also derives origin from the thorax, 5th to 2nd ribs near their sternal ends. It is continued out to the shaft of the humerus, terminating in a strong tendon. Described at greater length, and comprising lumbar fascia, the above pair of muscles are essentially alike in *Dasypus* and *Chlamydophorus*[1]. Cuvier's figures[2] are in concord with Galton's observations[3]. Huxley's memoranda I append as a footnote[4].

5. *Muscles of the Fore Quarters.*

Pectorales.—From its comparatively great length, the p. major would seem to have more retractile than adducting power. It extends abdominally half an inch behind the xiphoid cartilage, there narrow and tapering. It reaches forwards to the manubrium, but is meagre in costal attachment, though fastened to the inner clavicular cartilage and bone for about a third of its length. Its tendinous insertion is the inner edge of the prominent deltoid process, fascia continuing to the forearm. What may constitute a deep layer of the preceding, or, as lief, a pectoralis minor, is a long narrow strip, with an origin from the 5th and 6th sternal ribs. In trending outwards and forwards, it goes over the surface of the biceps, and there, weak and tenuous, is fastened in part on its tendon, while some fibres continue upwards towards the shoulder-joint. The preceding condition answers well to what is recorded of the pectorales in *Chlamydophorus*. Huxley assigns a wide clavicular origin to the p. major in *Dasypus sexcinctus*, and describes a

[1] Hyrtl, *l. c.* p. 33. He terms the two divisions "vertebral et costal."

[2] 'Recueil,' pls. 259, 260.

[3] *L. c.* p. 531.

[4] The notes of Prof. Huxley's dissection of *D. sexcinctus* run thus:—"The latissimus dorsi has an extraordinary origin by a broadness of fibres, which arise near the junction of the sternal and vertebral ribs, interdigitating with those of the serratus and external oblique—and an ordinary origin, which is exceedingly extensive, and where the fibres converge, pass over, and become connected with the angle of the scapula. These latter are for the most part continuous with the very large 'dorsi epitrochlear,' which passes down on the back of the arm as a sort of accessory extensor, and is inserted partly into the fascia covering the olecranon, and partly into that which covers the flexor muscles, and is continued into the palm. The rest of the muscle goes to the ordinary insertion into the humerus." (MS. Lectures, 1865.)

p. minor—that also referred to by Meckel, but which doubtless is the subclavius[1]. Cuvier's sketches rather reciprocate my determination. Galton's observation, echoed by Macalister, points to absence of a p. minor and of clavicular origin to the p. major. The ensiform origin in the "Tatu" Meckel ascribed as influencing respiration during the rolling up of the body[2]. In *Tolypeutes* it doubtless deflects the xiphoid segment, but that to give stowage-room to the abdominal viscera, the assistance to respiratory function probably being a sequence.

A distinct subclavius arises from the expanded end of the first rib, close to the sternum. It passes under the clavicle, is connected to that bone and to the deep cervical fascia, being finally inserted upon the tendinous arch between the coracoid and acromion. Hyrtl recognizes it in his monograph[3]; but it has been mistaken by others, as mentioned, for a p. minor, though Galton has correctly appreciated its character[4].

There is a supracostalis derived from the sternal end of the 1st rib; thence it covers the outer halves of the 2nd, 3rd, and 4th sternal ribs, extending beyond to the 5th, 6th, and 7th by a thin glistening fascia. This, the sterno-costal muscle of Cuvier, I presume is the rectus thoracicus lateralis of Macalister[5]. With the latter author, however, I do not agree in recognizing it as a prolongation of the rectus abdominis. In its oblique inward diagonal direction to that muscle, the fact that the rectus in many instances runs beneath it with quite a separate first costal fastening, and the occasional presence of a second external supracostal, we have similitude to additional though abnormal scaleni, or to deep pectorales, rather than to extension and differentiation of the abdominal rectus.

Humeral Extensors.—The deltoid has an extensive origin, partly from the outer half of the clavicle, partly from the acromion process and scapular spine to its expansion, thereafter mingling with the dorsal fascia. Fleshy below, it is fastened to the outer humeral neck and deltoid process, excepting what is occupied by the pectoralis-major tendon. The scapular head of the triceps is very broad, one border, as already stated, intermingling with dorsi epitrochlear. Its olecranal insertion is extensive, according therefore with the enlargement of this ulnar process. The long humeral division of the muscle is smaller than the preceding; and the third shorter head has origin below the teres major. Besides what may be regarded as an anconeus externus, there is a well-marked and fleshy representative of an anconeus internus, the "epitrochleo-anconeus" of Prof. Wenzel Gruber[8]. The presence of the latter in *D. 6-cinctus* is attested by Cuvier[6] and Galton[7].

[1] MS. Hunterian Lectures. [2] French ed. tom. vi. p. 372. [3] P. 32. [4] *L. c.* p. 528.
[5] Ann. Mag. N. H. July 1869, p. 55. [6] Recueil, pl. 260 u[1].
[7] *Loc. cit.* p. 539, pl. 44. fig. 2, E A.
[8] Mém. d. l. Acad. Sci. d. St.-Pétersb. tom. x. 1867. In his dissertation on this anomalous anconeus in Man and animals, Gruber specially depicts that of the Three-banded Armadillo (*Dasypus tricinctus*), tab. ii. fig. 3, in a dissection of the right axilla and fore limb. He has given a full description of the same (p. 20), which I quote at length in his own words:—"Bedeckunglage.—Der muskel ist von dem latissimus dorsi kommenden anconeus fleischig bedeckt. Er liegt zwischen dem triceps brachii, dem nur mit einem kopfe von der ulna entspringenden ulnaris internus und dem epitrochleus entspringenden muskeln im sulcus epitrochleo-anconeus über den nervus ulnaris und über einen von der medialen fläche des olecranon entspringenden 6 lin. breiten und 3–4 lin. breiten fleischkopf des flexor digi-

The scapular muscles offer little, if any, variation from the recorded examples of *Dasypus*, *Tatusia*, and *Chlamydophorus*. The subscapularis reaches but does not go beyond the ossified cartilage. The supraspinatus slightly overlaps the bone at the neck, and at its vertebral end fills the fossa, save what space pertains to the rhomboideus capitis and protractor of the first movable zone. Like the above, the infraspinatus has an ordinary humeral insertion. As the teres major starts from the inferior posterior border of the downward projecting scapular angle, it is in close junction with the second division of the latissimus; its humeral insertion is below and deeper than the latter. There is a rudimentary teres minor.

Of humeral flexors, the biceps is double-headed, its scapular tendon strong compared with the coracoid one. The powerful distal tendon glides in the lower humeral groove and over the coronoid process to the pit beneath, the coronoid eminence acting as a fulcrum in flexion. In *Dasypus* both singleness and duplicity of origin and insertion have been met with by different observers [1], the neck of the radius receiving a share of the terminal tendon. *Chlamydophorus* has a biceps agreeing best with that of *Tolypeutes*. I find the coraco-brachialis to be single, with a usual origin in conjunction with the biceps. It has but a moderately fleshy belly, and a very slender insertion upon the inner condyle over the supracondyloid arch, therefore equivalent to the coraco-brachialis longus of Prof. John Wood [2]. This condition is that mentioned by Meckel [3] in the Tatu, and similarly figured by Cuvier in *D.* 6-*cinctus*—though Galton [4], with whom Macalister coincides, describes a second head of origin (short variety of Wood) in the latter species. The flat, strong brachialis anticus comes from behind the humeral neck, curves forwards below the deltoid bridge, and terminates by tendon in the coronoid pit of the ulna, along with but outside the biceps.

A single supinator muscle alone is indicated, this in itself being indefinite. Some fascia with obscure fleshy fibrillæ comes from below the brachialis anticus, and appears to go to the radial neck. Both s. longus and s. brevis are deficient in *Chlamydophorus*; but in *Dasypus* a muscle better developed but with similar relations to that in *Tolypeutes* obtains. Huxley [5] and others regard it as a supinator brevis.

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torum profundus hinübergespannt. Gestalt.—Der muskel hat eine dreiseitig pyramidale gestalt mit einer medialen vordern und hintern fläche. Grösse.—Der muskel hat eine länge von 1 z.; eine breite von 2 lin. am ursprunge und 5 lin. an der insertion; eine dicke von 3 lin. muskel ist der absolut dickste der bis jetzt untersuchten thiere. Ursprung.—Der muskel entspringt mit einer kurzen und sehr starken sehne vom epitrochleus, aber mit keiner verlängerung von die innere wand des canalis supracondyloideus humeri darstellenden knochspange an dem ganzen hintern rand der 1–1½ lin. dicke coracobrachialis zum schnitze des durch den canal durchtretenden nervus medianus und der vas. brachialia sich ansetzt. Insertion.—Der muskel inserirt sich an die mediale fläche des olecranon vor den anconeus longus und zwischen dem anconeus internus und ulnaris internus medianwärts von einem fleischkopfe des flexor digitorum profundus, welcher ihn von der ellenbogengelenk-kapsel scheidet mit dem anconeus internus und ulnaris internus ist der muskel an der insertion-stelle verwachsen. Nerve.—Dieser kommt wie bei andern thieren, die den muskel besitzen, vom nervus ulnaris."

[1] Recorded single-headed by Galton and Macalister, papers cited; but the latter, with Prof. Haughton, has met with it double-headed in an Armadillo, species not certified. Journ. of Anat. 1868, p. 285.

[2] Journ. of Anat. 1867, p. 51.

[3] Anat. Comp. (Paris) vol. vi. p. 280.

[4] *L. c.* p. 534, pl. 44. figs. 1 & 2, C B, C B¹, and C B².

[5] MS. notes, dissection of *D.* 6-*cinctus*.

Extensores carpi radialis longior et brevior are met with in distinctness. The former, fair-sized, has origin below the supinator, and between it and the external condyle. As its distal tendon, at first broadish, narrows inferiorly, it passes over the end of the radius, and is inserted upon the protuberant internal knuckle and top of the trapezio-trapezoid bone. The latter, second muscle is more compressed, and starts by tendon from the external condyle, but ends by a fleshy insertion on the outer edge of the radius to about the middle of the bone. With unity of belly, the carpo-radial extensor in the six-banded Armadillo is provided with two terminal tendons, one to the indicial metacarpal, the other to the third metacarpal[1]. In *Chlamydophorus* an indicial tendinous insertion is alone mentioned.

The extensor communis digitorum is derived equally from the external condyle and the intermuscular fascia. It divides into a pair of tendons above the wrist-joint. The broader and much the stronger one supplies the enlarged middle digit, the lesser goes to the fourth or outer digit, both being partially fastened to the powerful rigid claws as well as the bone. Hyrtl, in *Chlamydophorus*, and Meckel and Galton, in *Dasypus*, state that the 2nd, 3rd, and 4th digits receive tendons, the latter authority figuring[2] two oblique phalangeal intercommunications; whilst Huxley alludes to a tendinous expansion on the back of the manus.

There is a smaller muscle arising from the external condyle outside the common extensor. It passes separately to the outer groove on the back of the distal extremity of the ulna, previously splitting into two unequal-sized tendons. The smaller and shorter goes to the outside of the fourth digit. The larger inner one has a double insertion, viz. broadly into the top of the root of the fourth toe, and by a narrower tendon on the outside of the great clawed third toe. Besides attachment to the carpo-metacarpal fascia, the latter is in connexion with an inner recurrent tendon fixed to the ex. communis. No slip was sent on to the third digit in the opposite left limb. The above evidently represents an extensor minimi, and in part an e. medius digiti. Besides the foregoing, an extensor indicis is present. This has an ulnar and interosseo-membranal origin, and it sends a flat tendon on to the terminal phalanx of the inner second digit. There is, moreover, an extensor ossis metacarpi, but no extensor primi and secundi internodi. The former of these three comes from the upper outer surface of the ulna below the olecranon, and partly from the interosseous membrane. It winds round the radius, arching over the long radio-carpal extensor, and is inserted into the trapezium.

In the 6-banded Armadillo, Galton[3] carefully registers and figures:—an ex. minimi digiti, with a single tendon to the metacarpal and proximal phalanx of the outer digit; an ex. annularis, with tendon bifurcating to proximal phalanx of 4th and ungual phalanx of 5th digit; an ex. indicis, with a large tendon to the index and a smaller to the pollux; an ex. o. m. pollicis, terminating on the radial side of the pollicial metacarpal. Compared with these observations, a slight variation in absence of pollicial tendon to the ex. indicis and of ex. o. m. pollicis is what Meckel[4] avers of the Tatu.

[1] Galton as cited.

[2] *L. c.* pp. 542, 543, and figs. 1 and 2.

[3] *L. c.* fig. 5, pl. 44.

[4] Anat. Comp. (French ed.) vol. vi. p. 326.

As showing a certain agreement in the *Chlamydophorus*, Hyrtl[1] speaks of a "radialis externus" to the indicial metacarpal, an "extensor digiti quarti et quinti," and an "ex. proprius digiti minimi."

I found a palmaris longus of considerable size, with an inner condylar and intermuscular fascial derivation, and firmer connexion with the flexor muscles beneath. Its tendon, placed well to the inner aspect of the limb, ends in a powerful palmar fascia, which, fastened to the sesamoid ossicle, spreads more thinly over nearly the entire palm, ending in slips to the middle and outer toes. Excepting the slight division in this palmaris, there are no true perforated tendons to the digits. The termination of the radial nerve is intimately adherent to the fascia, as alluded to in the description of the brachial plexus. What I may term palmaris brevis, but which, more strictly speaking, represents a flexor brevis manus[2], has rather a fleshy derivation from the superficies of the palmar ossicle; and it divides into two slips ending in tendons, one on either side of the innermost or second digit. Huxley (MS.) hints separation of a palmaris longus inserted into the fascia of the manus; but other observers speak of its complete fusion with the flexor sublimis in *Dasypus*.

The flexor carpi ulnaris possesses an olecranal origin and insertion into the pisiform bone. The flexor carpi radialis is smaller, and with a much shorter belly, than the preceding. Its lower tendon commences about opposite the upper end of the lower third of the radial shaft, and, going behind the styloid process, lies in a groove in the scaphoid and is ultimately inserted into the trapezio-trapezoid bone. In apposition with the radial flexor, a representative of pronator radii teres is derived from the inner condyle and intermuscular fascia. Its widish tendon of insertion occupies the third lower quarter of the shaft of the radius upon its internal aspect. As regards these three muscles in the genera *Dasypus*, *Tatusia*, and *Chlamydophorus* there is no distinction worth mention; and neither in them nor *Tolypeutes* is there a pronator quadratus.

The next muscle or set of muscles includes representatives of flexor sublimis, flexor profundus digitorum, and possibly flexor longus pollicis. Without tearing asunder the fleshy fibres it cannot well be separated above; at the wrist it divides into several great tendons fixed to the proximal end of the palmar ossicle; and at the further digital extremity three fresh tendons are furnished. Reducing the upper mass to apparent constituents, I resolved these into five. 1. The portion simulating a flexor sublimis is but moderately bulky; it comes from the internal condyle, intermuscular fascia, and partially adnate fellows, and below forms superficially a strong tendon attached to the inner prominence at the proximal end of the palmar bone. 2. The largest portion of the muscular combination arises from the inner surface of the olecranon and whole of the inside of the ulnar shaft, a short slip moreover springing separately from the internal condyle. This double-headed portion, which possesses a tendinous exterior, terminates broadly on the palmar bone, there occupying superficially its proximal end, except the prominence restricted to the previous division. 3 and 4. Beneath are two small cord-like slips

[1] Mem. cited, p. 38.

[2] See an account of this muscle by Mivart and myself in *Hyrax capensis*, P. Z. S. 1865, p. 341, fig. 6; also remarks concerning the palmaris brevis in *Dasyprocta cristata*, P. Z. S. 1866, p. 402, fig. 2.

ending in tendons somewhat fused to the last. They arise chiefly from the sigmoid notch under the first-mentioned muscular division. 5. This, the shortest and deepest division, arises from the whole of the interosseous membrane and posterior surface of the shaft of the fibula. It has a more muscular insertion than the others into the entire breadth of the proximal end of the palmar ossicle, but deeper than the foregoing. The palmar bone in question is about 0·5 inch long, 0·3 inch broad at its upper end, where widest, and 0·2 inch in greatest thickness. It is heart-shaped; the proximal end is bifid, or with well-marked tuberosities; the distal extremity has a blunt apex. Superficially it is convex, but deeply concave or with a longitudinal broad mesial furrow.

As already intimated, three tendons are derived from its digital extremity; these proceed respectively to the toes. The middle one is enormously broad, thick, and correspondingly powerful, the others much less so, though strong. Their length bears a ratio to that of the digit, the innermost being longest. In all three toes secondary sesamoid ossicles are developed over the joint at the root of the clawed phalanx; but the middle tendon alone possesses within its substance an additional tiny sesamoid, which is situate close to the palmar bone.

Six most competent anatomists, viz. Meckel, Cuvier, Owen[1], Huxley, Macalister, and Galton, have investigated the preceding complex and remarkable muscle in the fore limb of *Dasypus*. The account rendered by the last-mentioned author is the most critical in detail, though the French savant's illustrations have an inherent diagrammatic value, and Owen's terse summary catches at the gist of the thing. It appears to me that what is recognized as sublimis includes my long palmar; and while Cuvier, Owen, and Galton state it to have two, Meckel adds a third pollicial tendon. My 2nd, 3rd, and 4th divisions are Galton's 1st muscular mass &c. of flex. prof. dig., and Owen's two portions of same. My 5th part more nearly corresponds to Owen's 3rd portion (longus pollicis) and Galton's 2nd, with its accessory parts. Five terminal tendons are given off from the palmar ossicle. Allowing for difference of diction and homological relation of parts, it results that this compound muscle in *Dasypus* bears close agreement with that of *Tolypeutes*, the latter necessarily being deficient in pollicial tendon. In *Chlamydophorus* the muscular bellies are a counterpart of the preceding, Hyrtl being in doubt as to division of long palmar and sublimis, the palmar aponeurosis, however, dividing to the four outer digits. Of the tendons derived from the palmar ossicle, he remarks:—"Flexor digitorum brevis, quorum singuli digiti, excepto pollice, binos obtinent." The manner of digital ensheathments and absence of true perforated tendons all these authors less or more agree to.

After having dissected the feet, a mishap befel them ere my notes were duly registered concerning the small deep muscles. I clearly made out strong interossei and other flexores breves. These were fewer in number than specified by Galton in *Dasypus*; but in absence of precision I omit further notice of them.

[1] "Notes on the Osteology of the Weasel-headed Armadillo," P. Z. S. 1832, p. 137, and the other writers as already quoted.

VII. Of the Skeleton.

After Cuvier's excellent chapter in his 'Ossemens Fossiles' [1], wherein the bony framework of the Three-banded Armadillo is brought into comparison with others of the group, Turner's critical summary of characters of *Tolypeutes tricinctus* [2], Owen's notices of osteological specimens in the Hunterian Museum [3], Giebel's article [4], where *T. conurus* is submitted to descriptive analysis, Gray's [5], Burmeister's [6], and others' remarks, my instituting a long and minute verbal account of the skeleton would be superfluous. I have preferred to figure most of the bones separately, or in connexion (where relation of segment is concerned), along with a characteristic view of the flexed skeleton. Thus the greater number of parts needful for comparison in a palæontological point of view, are rapidly surveyed and readily comprehended. I limit written material, therefore, to the more equivocal portions, or such as have hitherto been meagrely dwelt on.

1. *Skull and Mandible.*

	inches.
Extreme length of the cranium , ...	2·9
Greatest width (at descending portion of jugal)	1·4
Breadth at the mastoidal region	1·1
Length of the palate	1·8
Each row of teeth in length	1·3
Diameter, from the outside of one condyle to the other	0·85
The præmaxillæ in length (superiorly)	0·7
Greatest depth of the skull without the mandible	1·0?
Extreme length of the brain-cavity	1·6
Its narrowest diameter (at orbito-sphenoids)	0·6
Its widest diameter (which applies to olfactory and temporal regions) . .	0·9
Lower jaw in extreme length	2·4
From the anterior root of ascending ramus forwards	1·55
Height, from tip of coronoid process dropping perpendicularly.	1·0

In the view of the interior base of the skull (fig. 51) a portion of the frontal has been removed, which exposes a large surface of the frontal and maxillary sinuses. These are very extensive, and occupy within a trifle of the cranial breadth at this part. The general direction of the main septa is radial to the ethmoid bone, many transverse and oblique minor partitions to these constituting the distinguishing loculi. Besides these, laterally and in front, there is a very capacious maxillary chamber. This reaches from the front of the zygoma forwards nearly the whole length of the superior maxillary, and it materially produces the skull's maxillo-frontal breadth. It answers to the antrum of Highmore in human anatomy. At the sides of the thin ethmo-vomerine plate

[1] Tom. v. "Sur l'Ostéologie des Tatous et de l'Oryctérope."
[2] "On the Arrangement of the Edentate Mammalia," P. Z. S. 1851, p. 215.
[3] Osteol. Cat. vol. ii. spec. nos. 2297–2315.
[4] "Zur Characteristik der Gürtelthiere," in Zeitsch. f. d. gesam. Naturwis. (1861), Band. xviii. p. 93.
[5] B. M. Catalogues and "Entomophagous Edentata," P. Z. S. 1865, p. 379.
[6] 'Reise d. La Plata,' vol. ii., and 'Anales d. Mus. Pub. d. Buenos Aires,' vols. i. and ii. (various notices).

(partially visible, fig. 51) are the upper nasal passages, here rather narrow than otherwise. Outside them and in front is the reduced continuation of the frontal cells. The shell of the bone in the entire area spoken of is thin, and remarkably so at some parts. Thus whatsoever be the office of these air-cells, every provision is made for them, as they claim a major share of the front of the skull.

Prof. Gervais's cast in outline of the cranial cavity of *Tolypeutes tricinctus* (already mentioned) amply characterizes the figure of the interior osseous basal view of that of *T. conurus*. There is a broad trapezoidal olfactory section, a lengthened slightly forward tapering cerebral or mid division, and a short but wide cerebellar portion. The level of the first is considerably higher than that of the second and third. The cribriform plate of the ethmoid is completely cellular in structure; the crista galli is thick, rounded, centrally ridged, and with a marked upward and forward inclination, the top being perforated by many foramina. The parietal areas are relatively narrow, vertically high, and impressed with but few and faint sulci. In this specimen the transverse suture between the orbito- and basisphenoid has imperfectly coalesced, leaving a linear fissure; but, I find, in other genera of the Armadillo its closure is also long delayed. The optic foramina, of fair size, pierce the bone in front of the said suture and the sphenoidal fissures at each side. H. N. Turner remarks, as characteristic of the Dasypodidæ, that "the foramen rotundum is included in the foramen spheno-orbitarium" (*l. c.* p. 211); such appears to be the case in *Tolypeutes*, though in my *T. conurus* I may record the presence of a minute foramen midway between the sphenoidal and carotid apertures. Internally this was more notable on the right side; but although I passed a bristle into it almost 0·2 inch, I could detect no exterior aperture. The reverse was the case on the left side, where interiorly an orifice was barely visible even with a magnifier; but exteriorly, equidistant between the foramen ovale and the sphenoidal cleft, a foramen of some depth existed; but which I could not make out to communicate interiorly. I am left in doubt, therefore, if this be an occluded representative of foramen rotundum. There is a wide and relatively long groove for lodgment of the trunks of the trifacial nerves and the Casserian ganglion. The foramen ovale is more elliptical antero-posteriorly and further distant from the sphenoidal opening than in the larger-skulled *Euphractus* (*E. villosus*). The foramen spinosum is not behind the foramen ovale within the skull, as in the last-named genus, but to the inside, and situate between it and the carotid groove, though exteriorly it opens in front of the foramen ovale. The trihedral periotic has a considerably forward elongate apex; and the fossa behind the prominence of the semicircular canals (equivalent to the sigmoid groove of the lateral sinus in Man) is excavated deeper than in most of the Armadillos. The latter feature tallies with the well-developed flocculus of the cerebellum. Lower than and one line within the fossa is the scale-covered fissure of the aquæductus vestibuli; an emargination of the bone below this, and a trifle in advance, hides the aquæductus cochleæ. The clefts, viz. foramina lacerum, medium, and posterius, are each long and patent; a narrow bar of bone separates the large anterior condyloid foramen from the jugular fossa [1].

[1] This and the subsequent descriptive footnotes on the bones of the Apar (*Dasypus* [*Tolypeutes*] *tricinctus*) are Prof. Owen's own comments attached to the specimens presented to the College of Surgeons by Mr. Charles Darwin

Regarding the exterior configuration of the cranium of *Tolypeutes*, Turner, Owen, and Giebel have demonstrated its salient characters, to which I shall only add remarks on the tympanic region, for reasons afterwards to be specified. Those authors justly allude to the laminar, imperfect annular nature of the tympanic, and its differing, therefore, from that of certain other Armadillo genera.

In *T. conurus* I find the tympanic to be $\frac{3}{4}$ of a circle (0·25 inch in diameter), deeply grooved on its inner aspect for the reception of the membrana tympani. It is fastened behind to a circumscribed ledge at the fore part of the descending mastoidal element, and, while partially free in circumference, impinges anteriorly and above upon the broad end of the malleus: the latter nearly completes the osseous ring. In the recess at the back of the jaw-articulation a postglenoid foramen leads into the cranial diploë above, a secondary communication opening outside behind the root of the zygoma. At the fore margin of the tympanic, and between it and the glenoid surface, is a considerable-sized oblique opening, with downwardly continued bony groove, which I apprehend to be the Eustachian foramen; for alongside and immediately beneath is a cleft, converted into a tunnel by membrane &c., answering best to the fissura Glaseri. Inward from these is the carotid orifice, all but continuous with the foramen lacerum posterius. Below the tympanic plate a roughened exostosis on the petrosal is apparent; and on removal of the tympanic and auditory ossicles this so-called tympanohyal becomes more conspicuous. The cochlear prominence is moderate, partly hiding the fenestra rotunda, the long diameter of this aperture being obliquely towards the anterior condyloid foramen. The fenestra ovalis is situate 0·1 inch higher. The names of these fenestræ are reversely appropriate as regards shape; and the latter is the smaller of the two. Encompassing them rearwards is a well-marked furrow, apparently equivalent to the aqueduct of Fallopius, overarching which is the mastoidal segment. This barely evinces trace of a styloid process, the narrow ledge in its position supporting the tympanic as aforesaid. Above, and close by, however, is a stylo-mastoid foramen; behind, a short nipple-shaped mastoid process, posterior and at the root of which a large mastoid foramen obtains.

Of the small ear-bones, the malleus has an expanded trihedral base, tenuous centrally, and thicker at the margins; that on the right side in this specimen possessed an outward

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after his return from the voyage of the 'Beagle.' I am not aware of their having been published in a separate paper; and as, disjoined in the Osteological Catalogue, they are likely to escape the notice of writers, I here append them in a somewhat connected form. Affixed to the quotations are the numbers of the specimens in the said vol. ii., transposed, however, to the regional distribution of the bones, and not numerically consecutive.

Skull.

"The tympanic is a distinct lamina of bone bent in a half circle; the membrane connecting its inner and under border with the lower part of the petrosal is not ossified so as to form a continuous tympanic bulla as in the *D. peba*. The mastoid is also distinct, is perforated by a vein from the lateral sinus, and terminates below in the usual process. There is no paroccipital. The lachrymal is large, and forms a triangular plate upon the face outside the orbit. The alisphenoids join the parietal; the chief expansion of the skull is for the lodgment of the large olfactory capsule. There are two small prenasal ossicles. There are no teeth in the premaxillary bones, but nine on each side of the maxillaries, and the same number on each side of the lower jaw" (2307).

apical (capitular) recess. The long process curves round the tympanic ring. The handle presents its thin edge to the tympanic membrane, and is bent sharply downwards and obliquely forwards. The incus has a more bulbous body, its limbs wide apart; the stapes appears to be perforated.

2. *The Spine, Chest, and Pelvis.*

According to my computation there are 7 cervical, 11 dorsal, 4 lumbar, 12 sacral, and 11 caudals in *T. conurus*,=a total of 45 vertebræ. Prof. Giebel, in the same species, mentions (*l. c.* p. 102) that there are 7 to the neck, 14 to the back, of which 11 bear costæ (dorsal), and 3 ribless (lumbar), 3 more, attached to the ilium; 3 free follow these, and another 3 are attached to the ilium, behind which are 2 longer ones (in all 11 sacral), followed by the encased tail-vertebræ, the number of which he does not state. The subjoined footnote [1] contains Owen's annotations on the spine of *T. tricinctus* in the

[1] *Vertebræ and Pelvis.*

Atlas.—"It has no large transverse processes; the sides of the vertebra appear to be truncate; they present near the back part a rudiment of a parapophysis and diapophysis. The side of the vertebra is perforated anterior to them, and leads to a canal which bifurcates, one branch terminating within the neural arch, above the articulation for the condyle, and the other perforating the neural arch. There is also a foramen at the back part of the hæmal arch, above the articular surface for the odontoid. There is no spine either above or below the vertebral ring" (2308).

Cervicals and Dorso-lumbar.—"The spine of the third cervical has completely coalesced with that of the dentata, which is thick and high, but more extended forwards than backwards. The spine of the fourth cervical is applied to its back part. The neural arches of the succeeding cervicals have no spines, but form thin transverse bars of bone, which in the middle are incomplete above the fifth and sixth cervicals, upon which the antecedent vertebræ are strongly bent backwards. Their bodies are extremely broad in proportion to their length or antero-posterior diameter. The articular bed for the head and tubercle of the first dorsal rib is contributed to in equal shares by the last cervical and first dorsal vertebræ. Ten vertebræ show the impression of the articulation of the head of the rib in addition to the first dorsal; and the neurapophyses of these eleven dorsal vertebræ are directly perforated by the spinal nerves. The articulation for the last rib is as equally divided between the two contiguous vertebræ as is that of the first rib. The prominence supporting the articular surface for the head of the rib answers to the 'parapophysis,' just as the prominence supporting the articulation for the tubercle of the rib represents the 'diapophysis.' The prominence in the first lumbar vertebra which articulates with the under part of the anapophysis of the last dorsal, repeats or tallies with the prominence in that dorsal which articulates with the head of the last rib: it is therefore a 'parapophysis.' The diapophysis projects, as in the dorsal vertebræ, from the upper and outer part of the base of the short and thick anapophysis; and this anapophysis presents, as in other Armadillos, two articular surfaces, one above for the under part of the metapophysis, another below for the upper part of the parapophysis. Thus the vertebræ are interlocked by tenon and mortice joints, as Cuvier has described: but it is by distinct parts of the vertebræ from those which form the corresponding joints in the backbone of serpents" (2297).

Sacrum and Pelvis.—"The sacrum includes 12 vertebræ, the spines of which unite to form a continuous bony crest. The anterior tuberosities of the ilia and the posterior tuberosities of the ischia are distinct epiphyses in this young specimen; the former are supported by the metapophyses of the first sacral vertebra, which also develops laterally two articular parapophyses. Ossification has not so far advanced as to unite the pubic bones together at the symphysis. The posterior sacral vertebræ present the same remarkable breadth which characterizes the other species of the genus *Dasypus*" (2298).

Caudals.—"The transverse processes are long, broad, and depressed, with their outer ends swollen into a rugous kind of exostosis. The hæmal spines of the last five vertebræ present a similar modification at their extremities, which relates to the attachment of the dermal bony sheath of the tail. Metapophyses begin to be developed upon

Hunterian Museum; but as to the numbers of vertebræ in the said specimens I make out the formula to be C. 7, D. 11, L. 4, S. 12, C. 12 = 46.

Baron Cuvier long ago enunciated of the neck of the Armadillos, "L'axis ne fait déjà qu'un avec la troisième dans de très-jeunes sujets; avec l'âge la quatrième s'y unit également, et probablement dans les vieux cette union va plus loin" (Oss. Foss. v. 131). Giebel alludes to *T. conurus* as having 2nd, 3rd, and 4th soldered; and such I found the condition in my specimen. Both body and processes of 2nd and 3rd were completely fused; but whilst the body and lateral processes were adnate in the 4th, the neural arch to a certain extent was free. Owen's observations in other respects apply to the cervical series of my different species. What he says further concerning the dorsal and lumbar vertebræ holds good, though I may add a few words by way of appendix to his and Giebel's descriptions.

A notable feature in the spine of the Three-banded Armadillo is variation of angle and curve; these are partly of a permanent kind. The 1st to the 5th neck-vertebræ, under ordinary circumstances, have a decidedly upward tilt. Those vertebræ hinging upon 5th and 6th are freely movable upwards and downwards as a whole, 2nd, 3rd, and 4th being totally rigid between themselves. The 6th cervical has but little freedom, and 7th still less: the two form the promontory of an angle dividing the neck from the thoracic cavity. The bodies of the three foremost dorsal vertebræ are inclined almost perpendicularly to the long axis of the spine; and the succeeding dorsals continue onwards to the loins by a sweeping curve which is on a less or more horizontal plane. Thence the pelvis forms a great arch, its hinder end nearly assuming the vertical, which is completed by the armour-clad tail. The caudals, in contrast to the cervicals, flex downwards and forwards.

Among the extinct Hoplophoridæ or Glyptodontes (notably the genus *Panochthus* of Burmeister and *Hoplophorus* of Lund) there obtains a most unusual anchylosis of three vertebræ—to wit, the so-called "trivertebral bone" of Huxley. By him it is regarded as a union of the 7th cervical and two foremost dorsals. Burmeister, on the other hand, contended that it was three anterior dorsal vertebræ in union, although this authority in his later memoirs seems to have modified his opinion in favour of the former view. It is highly interesting, then, to find in *Tolypeutes* an approach to the unique condition exhibited by those old armour-plated giants in this particular, furthermore to trace in the living three-banded Armadillo evidence of two other peculiarities of the fossil forms, viz. a partial ginglymoid jointing in the lumbar region, and a synovial articulation betwixt manubrium and first mesosternal piece. The condition of the parts certainly is not precisely like that of the fossil genera; still one may assume that what obtains is a first stage of anomaly. Perchance it may help to explain difficulties as regards trunk-flexion in the extinct solid cuirassed forms, or at least strengthen the clue to affinities and habits.

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the two caudal vertebræ, and continue after the anterior zygapophyses have disappeared on the seventh caudal. Hæmapophyses are articulated to the interspaces between the second and third, and so on, to the seventh caudal vertebræ inclusive, and in the following vertebræ are directly articulated to the under part of the centrum; they are flattened and expanded beneath" (2309).

As respects the representative of the *Glyptodon* "trivertebral bone" in *Tolypeutes*, the body of the last cervical is firmly soldered to the first dorsal. An intervertebral line of demarcation is barely appreciable except at the outer margins. Between the laminæ a delicate fissure can in part be traced. The spinous processes are separate, the cervical only impinging against the root of the dorsal; indeed in this case the fragile diminutive 7th cervical spine was broken off during manipulation, whereby an incomplete arch is shown in my plates. Of the two vertebræ in question their transverse processes and associated articular facets are alone apart. The cervical transverse process is slightly the longer of the two, bears a trace of bifurcation, and appears to have no vertebral foramen at its foot as has the vertebra in front of it (*i. e.* 6th cervical). The body of the 2nd dorsal, while closely adnate to the 1st, exhibits a shade less of anchylosis than between the latter and 7th cervical. Its long neural spine is free, and rakes backwards like that immediately preceding it.

Separation between the 2nd and 3rd dorsals is more marked; and, as far as I could make out, the fore thoracic flexion takes place betwixt them. The remaining dorsals have thin intervertebral cartilages, and but very slightly play upon each other.

A small, backwardly extending, tuberous ridge on each side of the inferior surface of the body of the 2nd lumbar announces the presence of hæmapophysial elements, which otherwise are wanting in the spinal column, save the tail. The final lumbar vertebra is firmly anchylosed to the sacrum and ilia; the penultimate is securely fastened to that behind, but without osseal adherence. Between the 3rd and 2nd there is, on the contrary, such freedom of movement that the pelvic region flexes upon this intervertebral space in an up-and-down direction, equivalent, in fact, to a kind of ginglymoid articulation. What I have termed the psoas ligaments, fastened anteriorly to the hæmal processes, are the lower stays of this restricted lumbar joint. The first and, indeed, second lumbar act somewhat in unison with the posterior dorsals, so far as angular tilt of the dorsal lumbar region is concerned.

In my specimen ossific union had taken place between the tuberosities of the ischium and the transverse processes of the last sacral vertebra. The final sacral and 1st caudal parts act upon each other as a ginglymus; and the solid armoured tail (as one indivisible piece), in bending downwards and forwards, carries with it the posterior arciform and inflected apical portions of the pelvic shield (*vide* figs. 8, 9 & 35). In other words, while the pelvis and its superincumbent shield descends, its posterior short incurved arch assumes a horizontal position, the rounded teceral plate of the root of the tail fitting into the semilunar cavity on the lower surface of said arch and terminal border of carapace. There further results a ligamentous union between the tips of the transverse processes of the 2nd caudal and the pelvic shield, and between the latter and ischial tuberosities. Again, the first moves freely upon the second caudal with its rearward less yielding successor; the transverse processes of the two former as well as of the last sacral possess sliding articular facets. Thus the 1st caudal in some respects resembles a fulcrum; and, what between the one and the other ligamentous bindings, that remarkable inversion of the tail and forward sweep of the terminal border of the pelvic shield is accomplished.

Pelvic admeasurements.

	inches.
Length from anterior spinous process of ilium to tuberosity of ischium in a straight line .	3·6
Length from anterior spinous process of ilium to obturator edge of acetabulum . . .	2·0
Length from ilio-pectineal eminence (=mid-acetabulum) to outer pubo-ischial tuberosity	1·3
Greatest vertical depth, viz. a line from sacral spine to symphysis pubis	2·0
Narrowest exterior diameter, viz. behind anterior iliac processes (which are a trifle wider).	0·85
Widest outward diameter, at front edge, rim of the acetabulum	1·75
Width from spine to spine adjoining the lesser sciatic-foramen notches	1·45
Diameter taken across the tuberosities of the ischium	1·75
Vertical or conjugate diameter of the brim of the pelvis	1·7
Transverse diameter of same	1·0
The oblique diameter (sacro-iliac synchondrosis to opposite outer pubic brim)	1·6
From the pubis to the spine of posterior ischio-pubic outlet	1·4
The inner or ischial diameter of the same	1·45
Greatest oblique diameter of posterior pelvic outlet	1·5

The outline of the brim of pelvis is somewhat egg-shaped, the symphysial being rather wider than the sacral end. The posterior or ischio-pubic outlet, a segment of an oval in figure, is considerably wider and shorter. The slender symphysis pubis is a wide low bridge of bone, with distinct centres of ossification from the outspread descending limbs of the arch. Another point I may as lief note is the presence of a double tuberculous elevation (*sp*, fig. 35) immediately adjoining what represents an abortive lesser sciatic notch.

The strong flat and broad first ribs are so firmly fastened to the manubrium as almost to restrict this costo-sternal arch to short antero-posterior movement during the respiratory act. There is not absolute anchylosis, as M. Nodot[1] and subsequent writers affirm is the case in *Glyptodon*; but it is possible that, as age advances, a true bony union may also result in *Tolypeutes*. Withal it is but a grade of solidification; for otherwise, as concerns respiration &c., the functional effects must have a certain identity. The 2nd rib has a long ossified costal cartilage (sternal rib), which articulates laterally with the manubrium. The succeeding four ribs, with increased and wide arching, possess proportionally very lengthened sternal appendices. These latter are almost entirely true bone, the semicartilaginous part being that attached to the ribs—and by a synovial joint, as Parker[2] has shown in *Tatusia*, *Xenurus*, and *Dasypus*. During the rolling-up action of the body the six anterior (true) ribs and inner segments have a tendency to be huddled together and override. As a provision, the sternal pieces are widest outwards; and between each other there exists an articular facet. The sternal appendix of the 7th (foremost false) rib is united by bone inwardly to the 6th. The last (11th) rib is longer than the 1st, and distinguished from it and the 2nd by being straighter.

Each piece of the breast-bone has an interest attached to it; and as a chain of bones their construction is admirably adapted to the modified positions which the animal

[1] Comptes Rendus, 28th Aug. 1855, and Mém. de l'Acad. Imp. de Dijon, tom. v. 1857.
[2] Ray Soc. Monog. 1868, "Shoulder-girdle and sternum," p. 205, pl. xxiii.

assumes. There appear to be five bony segments in all, a number less by one than in most Armadillo genera. The anterior and posterior are fair-sized, the intermediate ossicles small, the 4th especially so. The stout manubrium (præsternum) is slightly keeled, emarginate anteriorly, or with short clavicular forks. Besides articulations for 1st and 2nd ribs, there are additional facets at the rear outer border for the 3rd ribs—further a slightly concave articular surface, which receives the convexity of the second piece (mesosternum). This opisthocœlous sternal joint corresponds to the *Glyptodon* condition, commented on by M. Serres and others[1], and by Serres presumed to be a mechanism concerned in head-retraction. In the embryo Dasypinæ, however, Parker has proved (*l. c.* p. 206) that it is the rule rather than the exception. The 2nd, 3rd, and 4th sternal bones, each octagonal-figured, diminish serially. They are articulated synovially with four ribs apiece. The 4th diminutive segment is barely visible ventrally, being partially overlapped by the 6th costæ. The xiphoid resembles a flattened caudal vertebra, but with an outspread cartilaginous apex. It freely articulates by a double concave facet upon the posterior tuberous surfaces of the inner ends of the 6th sternal ribs, which meet and exclude opposition with the 4th mesosternal ossicle. The joint is a true ginglymus; and when the viscera are pressed forwards the xiphoid is thrown downwards and forwards.

3. *Pectoral and Pelvic Limbs.*

The clavicle is exactly an inch long. It is a thin, uniformly slender rod, with a slight middle forward curve; the inner moiety is flattened towards the ribs, the outer reversely so, or anteroposteriorly compressed. The truncate acromial end is a trifle expanded, the opposite tapering; and this latter is connected with the manubrium through the intervention of a flexible cartilaginous bar, 0·2 inch long. It is mainly the presence of this pliant sternal attachment that determines the great freedom of motion of the scapula &c. The shoulders being thus readily thrust forwards, conveniently permit of packing and infolding of the limbs, consentaneous with curvature of the body.

My illustrations of the segments of the limbs of *T. conurus* elicit the characteristic points, and, with Owen's remarks on *T. tricinctus*[2], supply what is wanting in detail.

[1] Serres, Compt. Rend., May and June 1863; Huxley, Trans. Roy. Soc. 1865; Pouchet, Journ. Anat. et Physiol. March 1866; Burmeister, Ann. & Mag. N. H. 1866, &c.

[2] *Fore Leg.*

Scapula.—"The clavicular half of the long acromion is an epiphysis. The coracoid is short and obtuse. There is a tubercle beneath the glenoid cavity. The suprascapular element is represented by a subtriangular coarsely ossified cartilage attached to the base of the scapula" (2310).

Humerus.—"It is short, thick, strongly curved, with prominent deltoid and supinator ridges, and is perforated above the inner condyle" (2300).

Manus.—"The four carpal bones of the proximal row are distinct from one another; the os magnum in the second row has coalesced with the metacarpal of the enormously developed digitus medius. The base of the metacarpal of the index is wedged between that metacarpal, the trapezoides, and the trapezium. The unciform also supports part of the middle metacarpal, as well as the short cubical metacarpus of the fourth finger and the rudiment of that of the fifth. The index digit has three phalanges. The medius and annularis have each two, and resemble each other in the character of their modifications, although greatly differing in size. The chief peculiarity, however, in this specimen is the very large sesamoid bone developed in the flexor tendons and filling the palmar aspect of the fore

The College-of-Surgeons skeleton, however, differs from the present specimen in the possession of four digits to the fore foot, which appears to be the normal number in the genus.

Unlike the distal ends of the tibia and fibula, which are soldered together into a single bony piece, the inferior extremities of the radius and ulna possess each a separate epiphysis. These latter approach and adhere by a thin fibro-cartilaginous film. The inferior articular facies of the radius is triangular, slightly concave, and with a descending tubercle or styloid process. The radius glides upon the scaphoid and semilunar bones. The ulnar end is oblong, transversely subcompressed; and its depending semilunar articular facet plays in the cuneiform and pisiform trough.

The proportionally large pisiform is applied against the cuneiform, so as to exclude the latter from the palm. Trapezium, trapezoides, and os magnum are coalescent. What appears to represent the first two on the dorsum articulates with the scaphoid, indicial metacarpal, and, partially, a corner of the mesial metacarpal. The magnum, anchylosed with the last, chiefly abuts against semilunar and unciform, though a small facet is in contact with the scaphoid. The unciform grasps the outer knuckle of the mid metacarpal, and presents a narrow facet towards the proximal metacarpal of the outer (4th) digit. Posteriorly it is in contact with the cuneiform, and, by an angle, touches the semilunar. To its outer margin a longish sesamoid is affixed. On the palmar aspect the os magnum is marked by the more prominent backward extension of the mid metacarpal.

Comparing the foregoing annotation on the manus of the 3-toed animal with Owen's 4-toed specimen (*infrà*), the differences consist only in greater anchylosis of inner metacarpals, magnum, and trapezio-trapezoid, with entire absence of the 5th digit.

It is in a great measure owing to this soldering of the main carpo-metacarpals, thereby producing rigidity, and to the enormous development of palmar sesamoid bone acting as support, brace, or fulcrum to the well-knit muscles and broad tendons of the palm, that the animal is empowered to tread upon the very tips of its fore claws.

The powerful femur, contrasted with humerus, is noteworthy, though the character is

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foot; a second sesamoid is attached by ligament to the apex of the large palmar one" (2304). "The scaphoid is the smallest of the four bones of the proximal row. The large pisiform articulates to the posterior interspace between the lunare and cuneiform, and forms, with the lunare, a large articular cavity, upon which the palmar patella plays. There is no distinct trapezium; if its homologue exist in rudiment, it is connate with the trapezoides. The magnum has coalesced with part of the base of the great cubical metacarpal of the digitus medius. The outer part of the base of that metacarpal rests upon the unciforme, which also supports the small, but thick, cubical metacarpus of the annularis, and the rudiment of the metacarpal of the minimus. The medius and annularis have each but two phalanges; the long and slender index retains the normal number of two phalanges" (2312).

Hind Leg.

Femur &c.—"The shaft is bent inwards above the base of the third trochanter. There is a small ossification at the middle of the outer semilunar cartilage. The tibia and fibula are attached at both ends to a similar common epiphysis" (2313).

Pes.—"The scaphoid is remarkable for its two inferior tuberosities, the interspace between which receives the underpart of the entocuneiform bone. The metatarsals and the phalanges of the middle digits are preserved, with the ungual phalanx of the innermost one or hallux" (2305).

one belonging to the group rather than a generic distinction. The trochanters are equally large, the 3rd rather low in position. The inner, larger condyle descends furthest. The patella is elongate and narrow.

Tibia and fibula are coossified at either extremity. Their proximal articular surface is convex, with a mesial sulcus; their thin distal end biconvex, or with a middle ridge. An external and an internal malleolus are fairly developed. The former fits into a grooved facet on the outer border of the astragalus; the latter clasps the said bone behind. There is considerable lateral compression of the tibial and fibular shafts.

As respects the 5-toed hind foot, departure from the normal type is less obvious than in the manus. The calcaneal process is of medium length, and has a slight inward swerve. The inner border of the naviculare sweeps broadly round the astragalus; and, as Owen observes, its plantar aspect is doubly knuckled. Upon the outer one of these and an inferior tuberose enlargement of the cuboid are two opposing facets and a narrow gutter; in this the deep-keeled surface of the strong plantar sesamoid slides. Subsidiary sesamoid ossicles underlie each phalangeal joint.

Some measurements of the long bones of the extremities.

	inches.
Scapula.—In extreme length (coronoid process to vertebral border)	2·35
Greatest width of vertebral border	1·35
Diameter, tip of coracoid process to anterior vertebral corner	1·65
Humerus.—Extreme long diameter	1·8
Ulna.—In extreme length	2·1
Its olecranon process, tip to upper edge	0·7
Radius.—Upper articular surface to end of styloid process	1·37
Manus.—Greatest length, viz. of wrist-joint to point of claw phalanx of mid digit	1·7
Femur.—In extreme length	2·65
Perpendicular height, summit of head to end of inner condyle	2·3
From upper end of 3rd trochanter to lowest point of outer condyle	1·8
Tibia.—In extreme length	2·35
Fibula.—Head to malleolar extremity	2·3
Pes.—Greatest length, viz. end of tuber calcis to tip of mid ungual phalanx	1·7

VIII. Considerations respecting the Relations of *Tolypeutes*.

Without attempting a comparison of all the minutiæ, I shall be content to glance at the points indicative of alliance, or expressive of functional correlation. The group Loricata, including the families Dasypodidæ and Glyptodontidæ, is in some ways a natural and well-defined one. Nevertheless in it characters crop up directing, like finger-posts, to other family relationships. Whilst the Glyptodontes exclusively belong to the postpliocene epoch, some of the Dasypodes, on the contrary (exemplified by the genera *Euphractus* and *Tolypeutes*), disinterred from the same strata, have survived up to the present time, and that, it seems, without perceptible variation in their organization. From this it may be inferred that the bulkier forms have been exterminated by undetermined causes, which agents have not succeeded in altering or decimating the undersized genera. The contemporaneous existence of the two sorts invalidates the idea

of their transmutation during the posttertiary epoch. Whatever other geographical relations pertain, as yet not fully worked out, it is quite evident that a partly similar area of South America was at one period inhabited by the two families in question.

As a link of the chain connecting the cainozoic with the recent Loricate fauna of South America, the Three-banded Armadillo claims paramount interest,—this because of its intermediate structural organization, and because of its exceptional habits, which together afford a glimmering of explanation of anomalies in the Hoplophoridæ or Glyptodontes. To read aright or track the significant imprint "of a conformation of the spinal column hitherto unknown in the mammalian, indeed in the vertebrate series," as Huxley puts it in reference to the latter fossils, is of itself justification for the present memoir.

Biologists are taunted with theirs not being a precise science; and never can it be so till piles of conscientious observations enable safe deductions to be drawn. It is by the fruits of accumulated labour that astronomers, like the prophets of old, dare to predict the future path of orbs whereon human foot has never trod, and eye alone seen. Thus the past, the present, and the future are indissolubly linked, and every step brings to us a clearer meaning of living things.

A lower base and upper cranial view of the skull of the Apar, *Tolypeutes tricinctus* (Linn.). The latter shows the supraorbital bony nodules, a specific character. (Woodcut used by permission of Dr. Gray; *vide* P.Z.S. 1865, p. 380, and B. M. Cat.)

DESCRIPTION OF THE PLATES.

Tabula XX.

Fig. 1. Life-size representation of the animal in its usual trotting attitude. Drawn from a photograph of nearly the natural magnitude, taken by Dr. Murie from the dead body but fixed into position according with life.

Tab. XXI.

Fig. 2. A profile of the right side of the carapace, &c., when the body is rolled up but not to the utmost limits of its closure.

Fig. 3. Appearance inferiorly when the body is bent together. This figure shows how the head, tail, and limbs are packed within the partially closed carapace. The body is less bent than in the preceding figure.

Fig. 4. The palmar surface of the right fore foot.

Fig. 5. Sole of the left hind foot as far as the heel.

These four drawings (Nos. 2 to 5) are exact copies of photographs from the dead animal; in the case of figs. 2 & 3, the body was flexed into a position similar to what had been observed during life. Each figure corresponds in dimensions to nature. The lettering, applicable to all, is as subjoined.

Cp, cephalic shield.
Sc, scapular shield.
Pv, pelvic shield.
T, tail.
Z^1, first, Z^2, second, Z^3, third, } movable zones.
ea, ear.
ey, eye, its surrounding orbital membrane.
Sn, snout where bare.
ff & *ff**, right and left fore legs and feet withdrawn towards the body.
hf & *hf**, right and left hind feet; the sole and nails of same peering out of their respective chambers.
Tch, tail-chamber.
Pe, penis retracted and bent alongside the tail.
II, III, IV indicate nail-digits, fore and hind foot respectively.
h, heel.
c, callous cushion or pad.

Tab. XXII.

Fig. 6. A view of the under or abdominal surface of the animal, with head and tail extended, and the limbs more or less withdrawn into their shield-cavities. This figure is slightly less than natural size, and lithographed from a photograph by Dr. Murie.

ey, Eye seen closed; *ea*, ear upturned; *Sc*, scapular, and *Pv*, pelvic shields; *Cp*, lateral margin of cephalic plate; Z^1, Z^2, Z^3, movable zones; *T*, tail; *ar*, inturned bony arches of the post-inferior end of the pelvic shield; *A*, the wide anal aperture; *Pe Pe**, penis; *hf*, right hind foot and leg partially withdrawn; *Hl ch*, left-hind-leg chamber, a portion of the foot and three nails being visible between the pointers; *Fl ch*, shadows indicating the unoccupied portion of the fore-leg chamber.

Tab. XXIII.

Fig. 7. Reduced diagrammatic sketch, showing the muscular fibres which act on the carapace. The latter has been removed to about the median line of the back.

Fig. 8. Portions of scapular and pelvic shields and three movable zones of the left side, seen on the inside, and displaying the digastric muscle which drags these armoured plates together. Drawn slightly less than natural size—partially from a photograph, and from the specimen itself.

The same lettering answers in these two figures, viz. :—*Csps*, contractor of the scapulo-pelvic shields; *Sc*, scapular, and *Pv*, pelvic shields, seen on edge in fig. 7 and below in fig. 8, where their marginal scutes and scales are visible; Z^1, Z^2, Z^3, moyable zones, their cut edges and inferior surfaces terminally tipped with hairs.

Fig. 9. *Tolypeutes conurus* in profile, when rolled up as in fig. 2, only in this case in a reversed attitude, or on the left side. The dermal armour has been cut away almost to the median line, exposing the body, head, limbs and tail stowed away in the least possible space. Part of the tegument remains on the limbs. The dermal muscles of the carapace (consult fig. 7) are removed; and the thin aponeurotic panniculus carnosus leaves the body and extremities in relief. Lithographed from a photograph.

Sh, shoulder over the scapula.
Rb, ribs on the thoracic region.
Hp, prominence of hip-joint.
Kn, side of the knee-joint.
hf, hind foot and lower leg.
ff. fore leg in part.
ar, cut bony arch of pelvic shield at root of tail.
Other letters as in preceding figures.

Fig. 10. Reduced sketch of the opened abdomen, displaying the visceral relations.
L, liver; *St,* stomach; *Sp,* spleen; *duo,* glimpse of the duodenum; *it,* coils of small intestine, the asterisk (*) denoting junction of ileum with *Co,* inflate colon, cæcal appendages being absent; *Pe,* penis; *te,* left testicle.

Fig. 11. Another sketch of the abdominal cavity, the stomach, intestines, &c. being removed.
k, k,* right and left kidneys; *te, te*,* abdominal situation of the testicles; *ub,* urinary bladder; *gb,* gall-bladder; *L,* liver; 1, 2, 3, 4, & 5, its several lobes.

Tab. XXIV.

Fig. 12. Muscles &c. of the body generally on removal of the body-armour, save a small part on the tail. The limbs of the left side have been taken away.

asp, anterior spinous process of ilium.
tb, ischial tuberosity.
ar, parts of arch of pelvic shield, the inner articulating with tuber ischii.
tu, tubercles studding dermal bony armour of dorsal surface of tail.
pl, osseous plates ventral superficies of tail, also anchylosed to the caudal vertebræ.
Inc, infracoccygeus.
Sc, tendon sacrococcygeus.
Lce & *i,* Levatores caudæ, externus and internus.
Lcd, representative of lumbocaudalis.
Gmx, gluteus maximus.
Tvf, tensor vaginæ femoris.
Rf, rectus femoris, in part.
Ve, vastus externus.
Bf, biceps femoris.
Admg, adductor magnus.
Sm & *t,* semimembranosus and -tendinosus.
*, slip of tendon from cutaneous muscle, and acting on pelvic shield.
Ga, gastrocnemius.
So, soleus.
Flh & *Fcd,* flexor longus hallucis and flexor communis digitorum.
P^1, peroneus longus.
$P^{2, 3, 5}$, peroneus brevis, tertius, and quintus tendons.
Eld, extensor longus digitorum.
pe, penis.
Eo, external oblique.
Smg, serratus magnus (its digitations).
Tz, trapezius.
Lad, latissimus dorsi.
Dep, Dorsi epitrochlear.
T^1 & T^2, triceps, first and second divisions.
D, deltoid.
Pma, pectoralis major.
Ba, brachialis anticus.
Ecr^{1} & ^{2}, extensor carpi radialis, longior and brevior.
Ecd, extensor communis digitorum.
Ei, extensor indicis.
Emd, extensor medii & minimi digiti.
Ecu, Extensor carpi ulnaris.
Fcu, Flexor carpi ulnaris.
Fs & *Fp,* combined flexor sublimis, profundus, and longus pollicis.
Rhc, rhomboideus capitis.
Ab, acromio-basilar, or levator claviculæ muscular slip.
Co, complexus.
gl, submaxillary and parotid glands.
r, reservoir or sacculus of the submaxillary gland.
sd, Steno's duct.
Ma, masseter.
Bu, buccinator.
Te, temporalis.
op, orbicularis palpebrarum.
z, zygomatic muscular fibres.
Oo, orbicularis oris.
ion, infraorbital plexus of nerves.
1, 2, 2*, 3, 4, retractores or levatores nasi et labii (consult text).

Fig. 13. The distended stomach and the spleen.

œ, œsophagus; *duo*, duodenum; *sp*, spleen.

Fig. 14. A transverse section of the kidney, showing calyces, papilla, &c.

Fig. 15. A dissected view of the genital parts, the penis being cut across towards its root.

UB, urinary bladder; *Pr*, prostate gland; *Cgl*, Cowper's gland, below and anterior to which is a section of the crus penis; *Bc*, bulbo-cavernosus; *Isc*, ischio-cavernosus, in part; *Rp*, retractores penis severed.

Tab. XXV.

Fig. 16. Heart and lungs of the Three-banded Armadillo, somewhat in the position they assume when the body is rolled up, but shrunk after immersion in spirits.

1, 2, 3, lobes of right and left lung; *i*, innominate artery; *rs*, *ls*, right and left subclavians; *rc*, *lc*, the common carotids, right and left.

Fig. 17. A view of the mouth, soft palate, &c.

Fig. 18. The tongue (*T*) as retracted within the lower jaw, the fleshy gums being left attached.

cp, circumvallate or fossulate papillæ; *cr*, coronoid process; *cd*, condyle.

Fig. 19. Sketch of the interior of the mouth at the root of the tongue, to display the isthmus and pillars of the fauces when contracted. About natural size.

T, tongue; *to*, tonsillar recess; *u*, uvula; *ep*, epiglottis dividing the pharyngeal passage.

Fig. 20. Another sketch of the faucial cavity, the velum pendulum palati being cut through and reflected and the glottis &c. exposed.

rg, rima glottidis; *ep*, epiglottis; *gef*, glosso-epiglottic folds.

Fig. 21. The hyoid bones, the larynx, and the upper portion of the trachea in profile and of natural dimensions.

Fig. 22. The same parts in front, *i.e.* their inferior aspect.

The lettering to these is as follows:—*T*, thyroid cartilage; *C*, cricoid cartilage; *m*, crico-thyroid membrane or ligament; *tr*, trachea; *bh* and *th*, united basihyal and thyrohyal elements; *ch*, ceratohyal; *eh*, epihyal; *sh*, stylohyal tipped with (*) a cartilaginous apex.

Fig. 23. Bones of the right three-toed fore foot of this ♂ specimen of *Tolypeutes conurus*, shown in three-quarters lateral view—that is, partly from the front and outside.

Fig. 24. The same right foot on its posterior or palmar surface, displayed somewhat on its inner aspect. The large ossicle of the flexor tendons has been taken away; but the phalangeal sesamoidea remain.

Fig. 24 *a*. The superior or wrist-joint articular surfaces of the proximal row of the carpal bones of the right manus.

To the three foregoing figures the same letters apply:—*s*, scaphoid; *l*, lunare; *c*, cuneiform; *p*, pisiform; *t*, trapezio-trapezoid; *m*, magnum; *u*, unciform; *mc*, metacarpals; *ph*, phalanges; *s*, sesamoidea; II, III, IV, digits.

Fig. 25. The right hind foot, its upper articular superficies.

Fig. 26. Sole, or under view, of the bones of the same foot, the tarsal, metatarsal, and phalangeal sesamoid ossicles being left in place.

In these two figures the digits are marked I, II, III, IV, V. Of the tarsal bones, *as* signifies astragalus; *ca*, calcaneum; *na*, naviculare; *cb*, cuboid; c^1, internal cuneiform; c^2, middle cuneiform; c^3, external cuneiform; *s*, several sesamoid bones.

Fig. 27. The inferior surfaces of the cervical and part of the foremost dorsal vertebræ, sternum, inner ends of clavicles, first ribs entire, and the succeeding attached sternal ribs or ossified costa

cartilages. The neck-vertebræ are exhibited with less angularity than is natural to the parts.

C, the cervical series; 1, atlas; 2, 3, 4, coalesced bodies of the axis, third, and fourth vertebræ; 5, fifth; 6, sixth, and 7, the seventh nuchal segment; *cl*, clavicle; *f*, fibrocartilaginous inner end of clavicle (the precoracoid piece of Parker); R^1, first rib; sr^2, sr^6, second and sixth sternal ribs; *m*, manubrium or præsternum; *x*, xiphisternum; *, terminal cartilage of same.

Fig. 28. Upper or laminar surface of the cervical and first two dorsal vertebræ of *Tolypeutes*, straightened and showing in part the open spinal canal.

C, cervical series; 1, atlas; 2, 3, conjoined second and third vertebræ; 4, partially separate arch of the fourth cervical; 5, 6, 7, succeeding cervicals, the last somewhat adherent to the dorsal; D^1, first dorsal; D^2, second dorsal vertebra.

Fig. 29. A front view of the seventh cervical and foremost two dorsal (= the trivertebral bone of Huxley in the *Glyptodon*) vertebral ribs and manubrial portions. Letters as in the two preceding figures, and all these of natural dimensions.

Fig. 30. Posterior surface of the last sacral vertebra and anchylosed ischial tuberosities, showing the articular facets of ischia whereon the bony arch of the pelvic shield play during curvature of the body and inflexion of tail.

tb, tuberosity of ischium; *t*, wide transverse process of sacral vertebra; *b*, body; *c*, spinal canal; *pf*, postarticular facet; *af*, process surmounting anterior articular facet; *n*, neural spine.

Fig. 31. Sketch showing foreshortened view of the fleshy snout and open nares; *n*, narial orifices, with incurved sesamoid cartilages.

Fig. 32. Dissection, lower aspect of, of jaws, neck, and chest. On the left side a superficial, and on the right a deep layer is exhibited. Reduced to about $\frac{2}{3}$ nat. size. Lettering employed as undermentioned:—

On right side.

Gh, geniohyoideus.
Sg, styloglossus.
hy, hypoglossal nerve.
Hg, hyoglossus muscle.
ca, carotid artery.
Rama, rectus capitis anticus major.
Cpx, cervical plexus of nerves (included within dotted line).
Bpx, brachial plexus of nerves.
Sb, subclavius muscle.
Spc, supracostalis.

On left side.

Mh, mylohyoideus; *Ma*, masseter.
Shy, stylohyoideus; *t*, trachea.
Sth, sternohyoideus.
Stm, sternomastoid, and *Stm** its thoracic extension.
Clm, cleidomastoid; *D*, deltoid.
Pmi, pectoralis minor, near insertion.
Pma. pectoralis major; *B*, biceps.
T, triceps, its third and first divisions.
Ai, anconeus internus.
Lad, latissimus dorsi; *Eo*, external oblique.

Fig. 33. A greatly reduced sketch, in profile, of some of the pelvo-femoral muscles, &c.

Os, a portion of the so-called oblique sacral muscle as it traverses the great sciatic foramen; *sn*, great sciatic nerve at different parts of its course; *Il*, iliacus; *Py*, pyriformis; *Ge*, gemelli; *Qf*, quadratus femoris; *Rf*, rectus femoris; *Ve*, vastus externus; *Adl*, small portion of the adductor longus: *If*, the ilio-femoral strip of muscle; *Bf*, biceps femoris; *Admg*, adductor magnus; *Smb* & *t*, semimembranosus and -tendinosus; 1 the great, and 3 the third trochanter.

Fig. 34. View embracing a dissection of the abdominal surface of the diaphragm and deep lumbo-pelvic parts. On the left side the lung and heart have been exposed by removal of a segment of the midriff.

Dph, diaphragm.
vc, orifice of vena cava.
oe, œsophagal opening, beneath which is the aortic cleft.
H, heart. *L*, lung.
ao, abdominal aorta.
psl, psoas ligament.
a & *n*, external iliac artery and anterior crural nerve.
ii, internal iliac arterial division.
Ql, quadratus lumborum emerging from chest.
Ips, ilio-psoas muscle.
Pe, pectineus.
Inc, infracoccygeus or infracaudal.
Sc, sacrococcygeus.
Isc, part of ischiococcygeus, at origin.
Os, oblique sacral muscle.
P, pubic arch.
of, obturator foramen.

Tab. XXVI.

Fig. 35. A side view of the endoskeleton of *Tolypeutes conurus*, minus the limbs, in illustration of the curvature of the spine and the manner in which skull (in outline) and tail are tucked together when the body is rolled up: compare figs. 2, 3 & 9. Nearly nat. size. A cut portion of the inferior arch of the pelvic shield remains *in situ*.

Fig. 36. Bones of the pelvis and tail, from above, the carapace being removed. Reduced in size.

Letters in this and preceding figure correspond, and are as follows:—*C*, cervical vertebræ; 1, atlas; 2, 3, coossified axis to third; 4, 5, 6, 7, remaining neck-pieces; *x*, xiphisternum; ↑ (arrow) pointing between 2nd and 3rd lumbar vertebræ denotes the axis or hinge of curvature of the posterior part of the spinal column; *s*, spinous process, or neurapophysis; *m*, metapophysis; *h*, hæmapophysis; *af*, articular facets, or anterior zygapophyses; *pf*, post-articular facets (= postzygapophyses); *b*, body and hæmal process; *t*, transverse process; *ch*, chevron bone (= hæmapophysis); L^4, last lumbar vertebra; *ass*, anterior superior spine (crest of ilium): *ais*, anterior inferior iliac spinous process; *a*, acetabulum; *gsf*, great sciatic foramen; *of*, obturator foramen; *p*, pubic arch; *sp* placed between two tubercles equivalent to a double ischial spine; *tb*, tuberosity of ischium; *ar*, section of part of the bony arch of the exoskeletal pelvic shield.

Fig. 37. The left humerus, its anterior face. Of natural size.

d, deltoid eminence; *cf*, condyloid foramen; *h*, head; *o*, outer, and *i* inner tuberosities.

Fig. 38. Exterior surface of the same bone.

Fig. 39. A lower segment of the humerus on its internal aspect.

Fig. 40. Left radius and ulna on their outer aspect.

Fig. 41. The same bones as seen from behind.

U, ulna; *R*, radius; *s*, sigmoid notch; *o*, olecranon; *st*, styloid process of the radius.

Fig. 42. A segment of the right scapula, to exhibit by a post-inferior view, *g*, the glenoid surface, and *a*, the inner curvature of the acromion.

Fig. 43. The outer dorsal superficies of the same entire shoulder-blade, also of nat. size.

a, acromion; *m*, metacromion; *c*, coracoid; *g*, glenoid fossa; *pi*, ossified post-inferior angle.

Fig. 44. Left femur, from the front: t^1 greater, t^2 lesser, and t^3 third trochanter.

Fig. 45. Inner border of same thigh bone: *h*, head.

Fig. 46. Front aspect of the left tibia (*T*) and fibula (*F*); *ep*, lower epiphysis.

Fig. 47. Their united inferior articular surface, *i. e.* part of ankle-joint. This and last nat. size.

Fig. 48. A foreshortened view of the hinder end of the left lower jaw.

cr, coronoid process; *cd*, condyle; *a*, angle of mandible.

Fig. 49. Inferior base of the skull of the Three-banded Armadillo (*Tolypeutes conurus*).

Fig. 50. Skull and inferior maxilla in profile.

Fig. 51. Cranium from above. The calvarium has been removed, exposing the brain-cavity, frontal, maxillary, and nasal sinuosities, &c.

These four figures are of natural dimension. The lettering in them bears correspondence.

N, nasal bone.
os, prenasal ossicles.
Pmx, premaxillary bone.
Mx, maxillary (superior).
F, frontal.
L, lachrymal.
Ma, malar, or jugal.
Pa, parietal.
Sq, squamosal.
Ty, tympanic.
Bo, basioccipital.
Bs, basisphenoid.
Ps, presphenoid.
As, alisphenoid.
Os, orbito-sphenoid.
E, ethmoid (cribiform plate).
Pl, palatine.
pt, pterygoid.
io, infraorbital foramen and canal.
f, mental foramina.
m, mastoid process.
mf, postmastoidal foramen.
c, condyle.

na, anterior apertures of nares.
ap, anterior palatine foramen.
fla, foramen lacerum anterius.
flm, foramen lacerum medius.
flp, foramen lacerum posterius.
ms, maxillary sinus (= antrum maxillare).
fs, frontal sinuses.
cg, crista galli (preethmoid).
op, optic foramen.
sp, sphenoidal fissure.
fo, foramen ovale.
fs, foramen spinosum.
fr, ? foramen rotundum.
vc, Vidian canals.
ca, carotid aperture.
pg, postglenoid foramen.
tyh, tympanohyal ossicle.
me, meatus auditorius internus.
ac, anterior condyloid foramen.
fm, foramen magnum.
la, depression of lateral sinuses.
a, angle of lower jaw.

Fig. 1

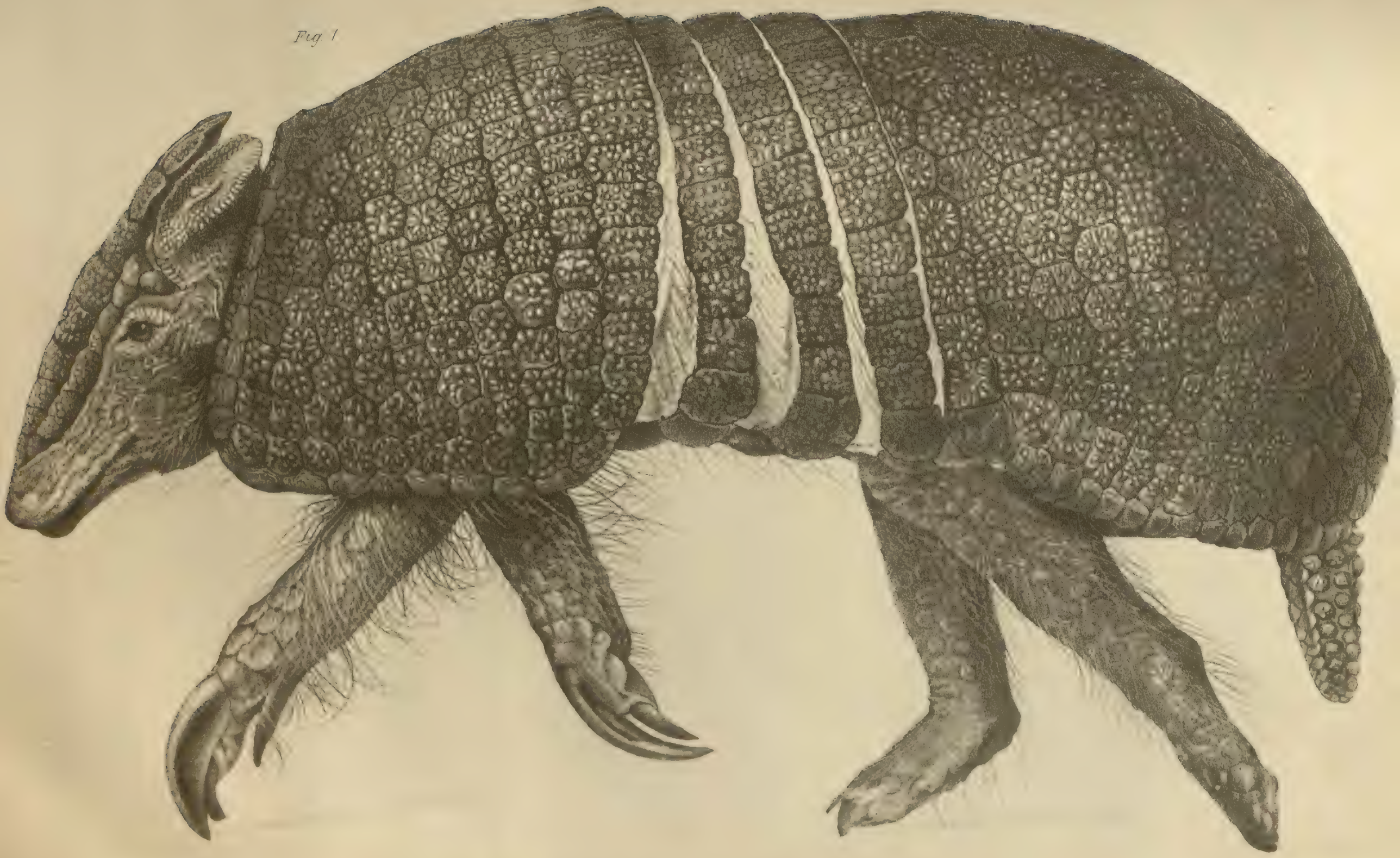


Fig 2

Fig. 4.

Fig. 5

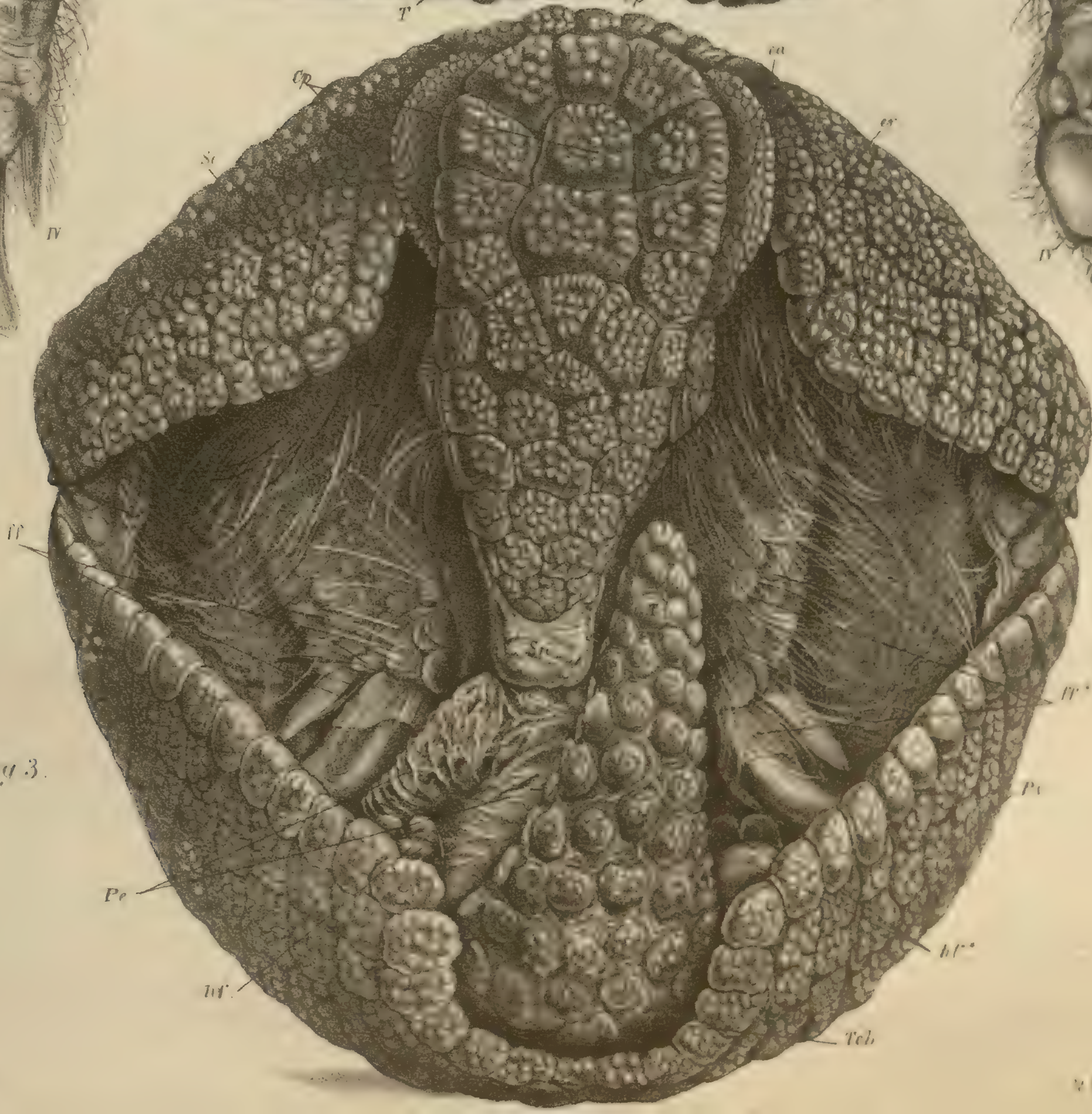


Fig 3.

C. Berjeau lith.

Fig. 6.

Berjeau lith

Fig. 7

Fig. 11.

Fig. 8.

Fig. 10.

Fig. 9

Fig 12.

Fig 15

Fig 13.

Fig 14

Fig. 21

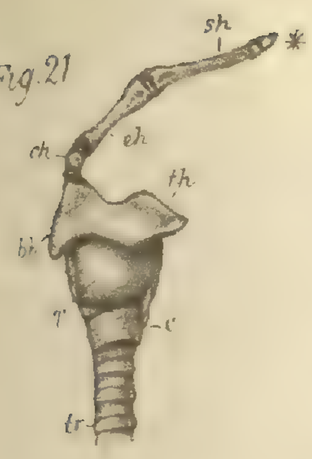


Fig. 24.

Fig 16.

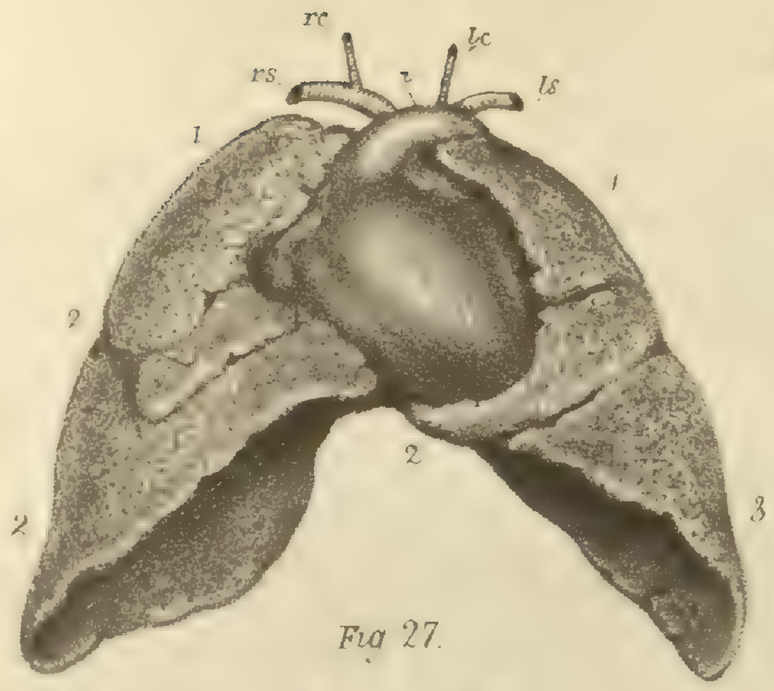


Fig. 23.

Fig 22

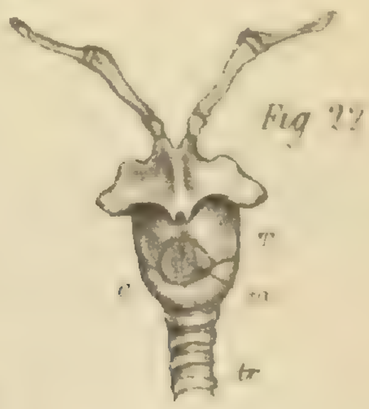


Fig 17.

Fig 27.

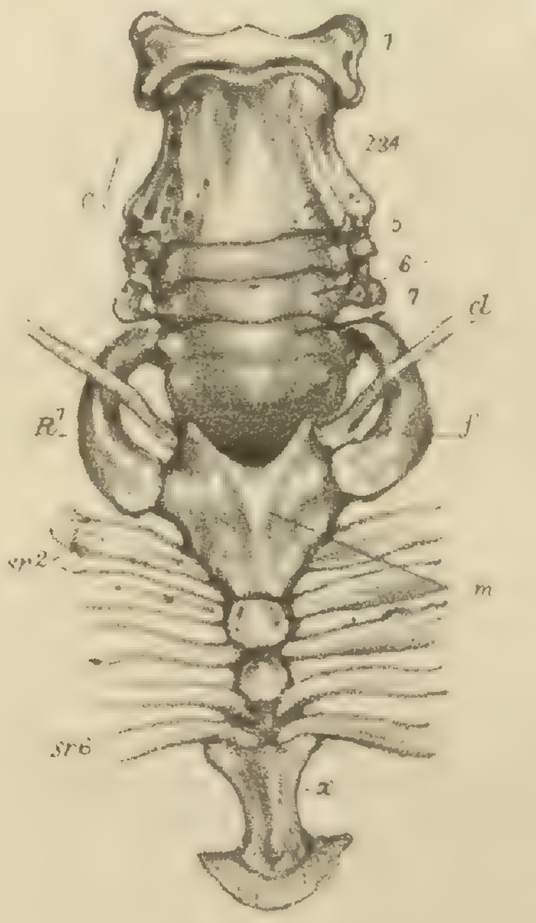


Fig 18

Fig. 20

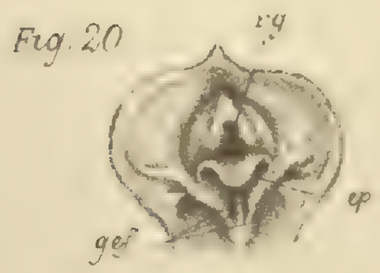
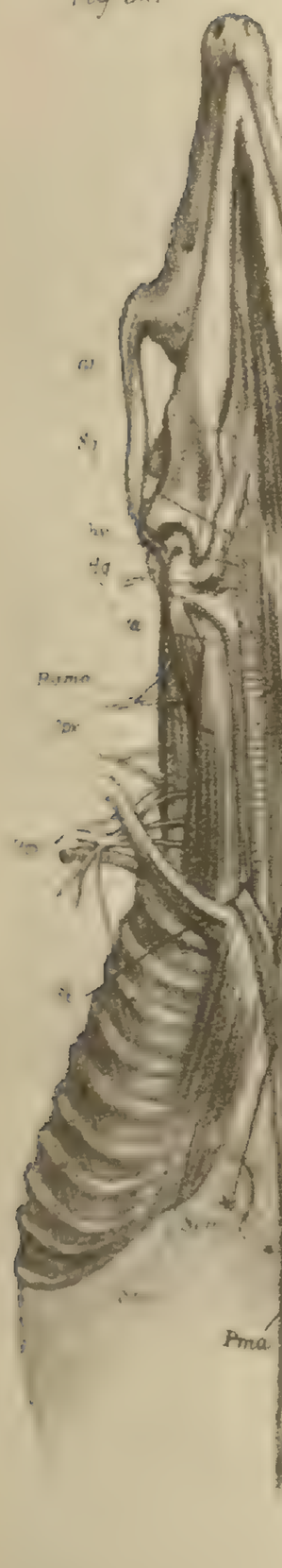


Fig. 19

Fig 25

Fig 26

Fig 32.



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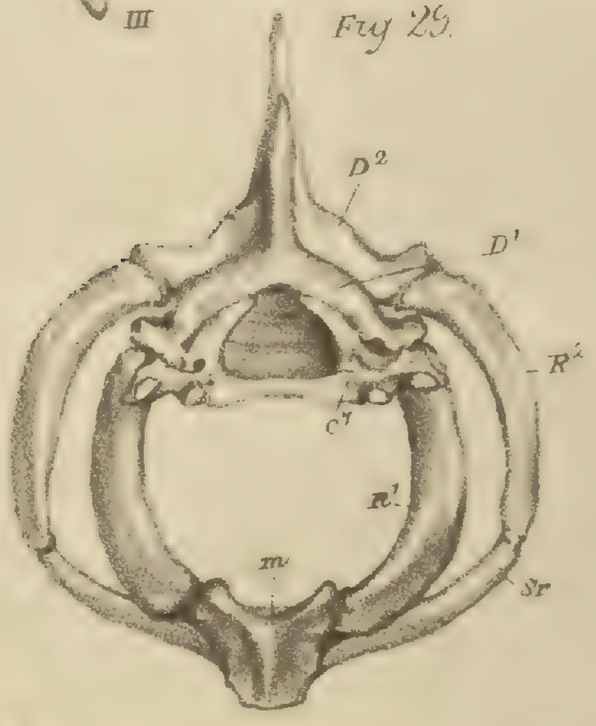

Fig 28.

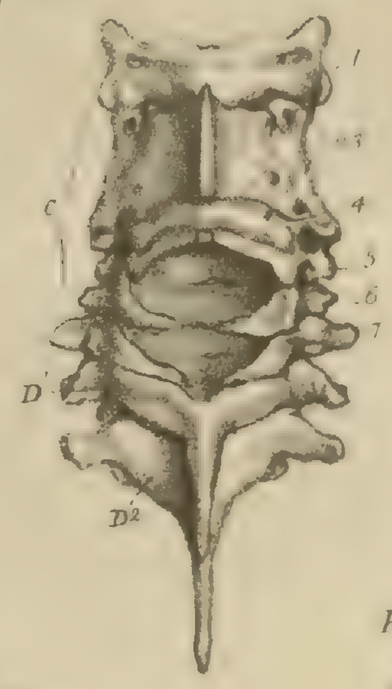

Fig 33.

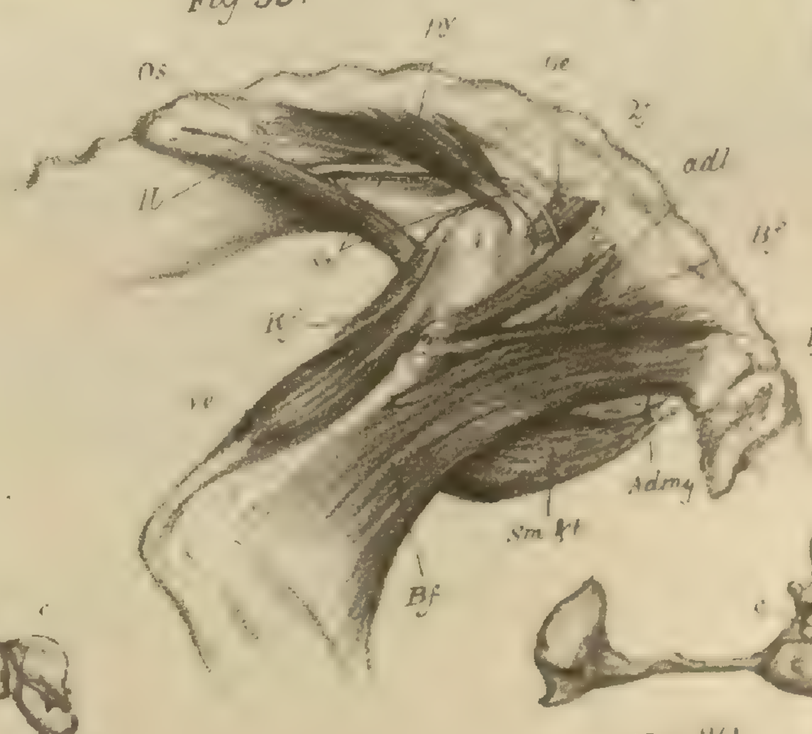

Fig 34

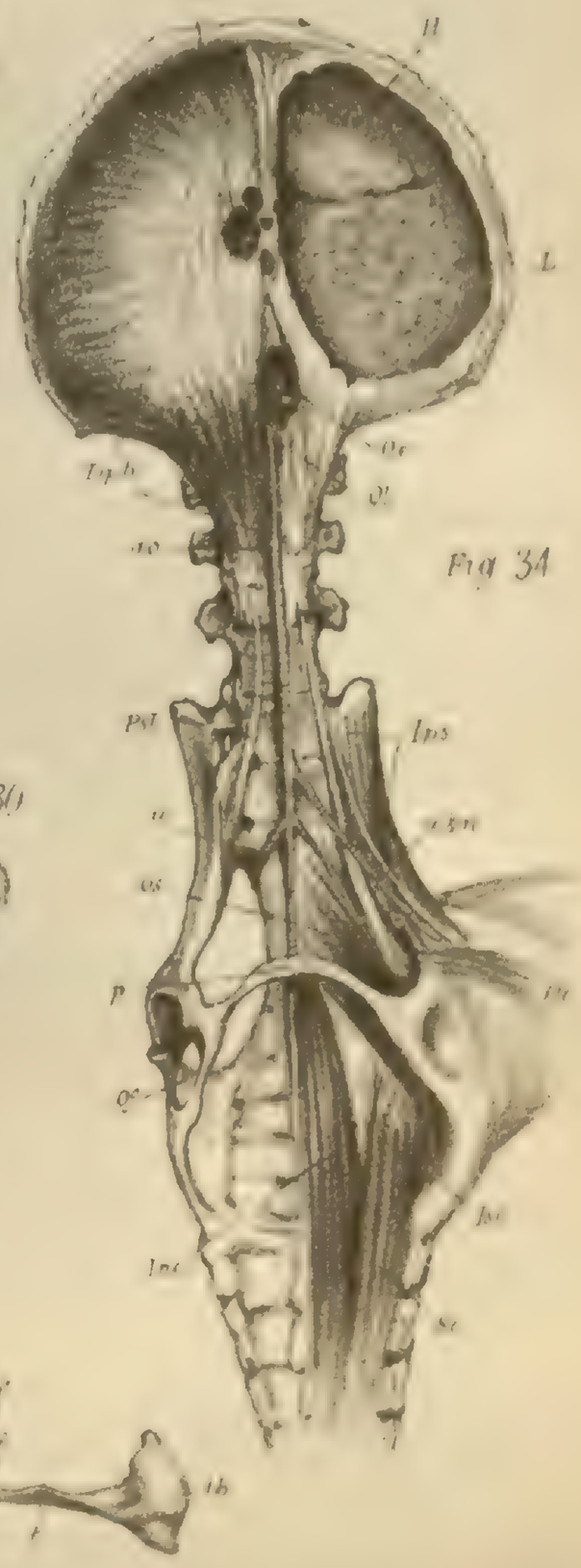

Fig 30

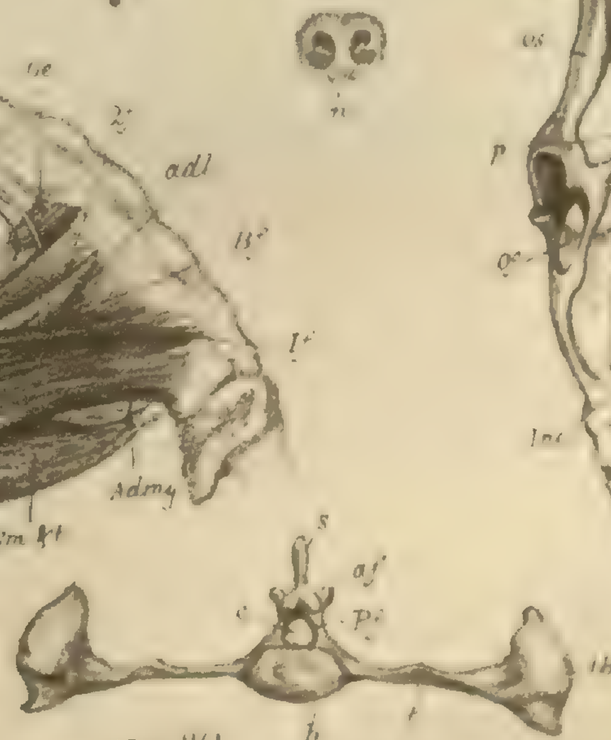

Fig 24a

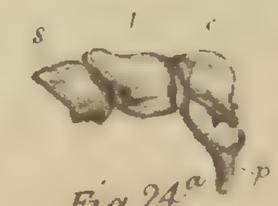

Fig 36.

Fig 37.

Fig 38.

Fig 39.

Fig 40.

Fig 41.

Fig 42.

Fig 44.

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Fig 46.

Fig 47.

Fig 48.

Fig 49

Fig 50.

Fig 51

Fig 43

Fig 35

C Berjeau lith

M & N Hanhart imp

IV. *Enumeration of the* Orchids *collected by the Rev.* E. C. Parish *in the neighbourhood of Moulmein, with Descriptions of the new Species.* *By Professor* H. G. Reichenbach, f.

(Plates XXVII.–XXXII.)

Read April 17th 1873.

The neighbourhood of Moulmein had been visited by Wallich's collectors, by Dr. Helfer the German botanist, by Dr. Griffith, the eminent English botanist, and by Thomas Lobb, the English collector for the firm of Messrs. Veitch.

Beginning with 1859, Sir William Hooker acknowledged the receipt of very interesting Moulmeinese plants coming from Mr. E. C. Parish; and Dr. Lindley spoke very highly of the sketches, and of a few specimens of Orchids he obtained from the same source. At the same time more and more Moulmeinese Orchids appeared in the trade, amongst which the beautiful *Phalænopsis Lowii* and a crowd of wonderful *Dendrobia* were the most striking. The names of the collectors were kept secret. It was, however, afterwards well known that the plants were sent by Mr. Parish and Colonel Benson.

The rich Kew Herbarium contained several interesting specimens and sketches sent by the first-named gentleman. When he came home in 1871 he brought with him a beautiful collection of careful water-colour drawings, with analytical sketches, which have proved exceedingly trustworthy. The collection of specimens and copies of the drawings were presented to the Kew establishment by their possessor. Having been invited to undertake the examination of the collection, I have compared them with the types preserved at Kew and with those in my own collection. It is my duty to acknowledge that Mr. Parish had done his best to name the plants correctly. I have therefore affixed to all the new species here described Mr. Parish's as well as my own name.

The Indian terrestrial Orchids, which appear to be generally widely spread over the Indian, Southern Chinese, Southern Japanese, Malayan, and even Northern Australian areas, contain a few very curious things, among which the most striking plant is the beautiful *Gymnadenia Helferi*, discovered more than thirty years ago by my unfortunate countryman.

The Epiphytes show a great tendency to approach the Malayan types. Up to the elevation of 5000 ft., where some of the Himalayan and Assam species appear, such as *Calanthe biloba*, *Phalænopsis Parishii*, *Cœlogyne præcox*, *C. prolifera*, *C. fuscescens*, we find numerous species with a decided Malayan aspect or affinity, of which the very numerous Erias and Bolbophyllums, the Thrixspermums, Thelasises, Trichoglottis, Renantheras, Appendiculas, and Podochiluses may be mentioned as proofs.

Excepting, perhaps, those plants which throw an entirely new light upon botany, none are more welcome than such as have been lost for a long time. I may name two of that kind: 1. Dr. Lindley's *Oberonia Myosurus*, named from very insufficient materials

gathered at Taka, in Nepal, 1821 (and unluckily combined with an *Eria* of the section *Phreatia*, the *Epidendrum myosurus* of Forster), has appeared once more in the present collection, and in such a state as to enable me to give a full description.

2. Much more fortunate for us was the rediscovery of the genus *Monomeria* of Dr. Lindley. It has only been found once by Wallich's collectors. When Dr. Lindley described it, he regarded it as the only Orchid that had no petals, though he afterwards found a similar instance in *Aviceps*; and I have observed it in an *Acianthus*. The Lindleyan dictum as to *Monomeria* proves, however, to be a mistake, very easily understood from the miserable state of his specimen. The petals were ascertained to be present in the Moulmeinese plant; and I afterwards observed them in the Nepalese plant also. Thus the plant would have been degraded to a very indifferent *Bulbophyllum* if Mr. Parish had not observed that it bore the full pollen-apparatus of the *Vandeæ*. I have the fullest belief in the statement, but feel very sorry I could not see it myself, since no anthers were at my disposal.

It is a very curious circumstance that Orchids appear to change a good deal under climatic influences. Such altered forms I have retained as subspecies; but to any one who judged the plants not by dissection of the flower, but by general appearance, they would appear to be new species, as, for instance:—*Cœlogyne ochracea*, subspecies *conferta*, a stout little plant, exceedingly unlike the tall Assam form; and *Bolbophyllum cupreum*, subspecies *stenosepalum*.

Aërides crassifolium might be mentioned as a third instance. It is closely allied to *Aërides falcatum*, Lindl. (*A. Larpentæ* of gardens), of which the geographic origin appears to be unknown up to the present day. I have been induced, however, by the very different shape and thickness of the leaves, to keep it as a species, the more so as the colours of the flowers are very different. I may have made a mistake in doing so.

Vegetable morphology, finally, has gained something by the collection of *Habenaria pelorioides*, a *Habenaria* having six nearly equal parts of the perigonium, like a *Scilla* or an *Ornithogalum*, without any spur. It is a very remarkable instance, bearing a highly curious analogy to the well-known *Dendrobium normale*, Falc., and the *Aclinia* of Griffith, notes on which, by Dr. Lindley, are to be found in the Journal of the Linnean Society, vol. iii. pp. 9–11.

Bulbophyllum lemniscatum, however, is the greatest glory of all the discoveries of Mr. Parish, a *Bulbophyllum* having, at the point where the chief vascular bundle of the sepals ends, a long, thin, nearly cylindrical, horny body, half pellucid, with ten wings radiating from the thin filiform axis, like the spokes of a wheel. This organ is deciduous. Whether it has any use in the economy of the plant, or is a beautiful ornament only, we do not know. The plant flowered at Kew; and a figure was given by Dr. Hooker in the 'Botanical Magazine' for 1872 (tab. 5971). The minute investigation of these organs is exceedingly difficult, on account of their thinness and want of entire pellucidity. I hope to give a better account in a short time. The only thing like those organs which has been hitherto observed is in Dr. Blume's Javan genus *Epicrianthes*, where six threads are represented in lieu of the petals.

After these few general remarks I proceed to give the list of the species, with

descriptions of those which I regard as new ones, under the authority Parish and Reichenbach.

Catalogue of the observed Species.

A. *MONANDRÆ.*

I. Ophrydeæ.

1. Aceras angustifolia, *Lindl. Gen. et Sp. Orch.* p. 282.
2. Platanthera Susannæ, *Lindl. Gen. et Sp. Orch.* p. 295.
3. Gymnadenia Helferi, *Rchb. f. in Flora*, 1872, p. 276.
4. Peristylus constrictus, *Lindl. Gen. et Sp. Orch.* p. 300.
5. —— goodyeroides, *Lindl. Gen. et Sp. Orch.* p. 399.
6. —— Parishii, *Rchb. f.*
7. Habenaria pelorioides, *Par. et Rchb. f.*
8. —— tipulifera, *Par. et Rchb. f.*
9. —— chlorina, *Par. et Rchb. f.*
10. —— digitata, *Lindl. Gen. et Sp. Orch.* p. 307.
11. —— spatulæfolia, *Par. et Rchb. f.*
12. —— vidua, *Par. et Rchb. f.*
13. —— corymbosa, *Par. et Rchb. f.*
14. —— trichosantha, *Lindl. Gen. et Sp. Orch.* 324.

II. Operculatæ.

1. Neottiaceæ.

15. Cnemidia semilibera, *Lindl. Gen. et Sp. Orch.* p. 463.
16. Cheirostylis flabellata, *Wight, Ic.* t. 1727.
17. —— malleifera, *Par. et Rchb. f.*
18. —— pubescens, *Par. et Rchb. f.*
19. —— Griffithii, *Lindl. in Journ. Linn. Soc.* i. p. 188.
20. Anecochilus albolineatus, *Par. et Rchb. f.*
21. Monochilus flavum, *Wall., Lindl. Gen. et Sp. Orch.* p. 487.
22. Etæria moulmeinensis, *Par. et Rchb. f.*
23. Hæmaria discolor, *Lindl.*, var. Dawsoniana, *Rchb. f. in Gard. Chron.* 1872, p. 321.

2. Arethuseæ.

24. Pogonia velutina, *Par. et Rchb. f.*
25. —— flabelliformis, *Lindl. Gen. et Sp. Orch.* p. 415.
26. —— maculata, *Par. et Rchb. f.*
27. Thunia Bensonæ, *Hook. f. Bot. Mag.* t. 5694.
28. —— pulchra, *Rchb. f. in Flora*, 1872, p. 276.
29. Galeola altissima, *Rchb. f. Xenia*, ii. 77?

3. Vandeæ.

30. Monomeria Crabro, *Par. et Rchb. f.*
31. Thecostele alata, *Par. et Rchb. f.*; Thecostele Zollingeri, *Rchb. f., Seem. Bonpl.* v. 37 (1857); *Xenia*, ii. t. 147! p. 133; Cymbidium alatum, *Roxb.*!
32. Acriopsis indica, *Wight, Ic.* t. 1748.
33. —— javanica, *Reinw. in Flora*, 1825, ii. 4; *Blume, Bijdr.* 376; *conf. Syll. Pl. Ratisb.* 1829, L.
34. Calanthe biloba, *Lindl. Fol. Orch.*; Calanthe, n. 5, var. obtusata, *Par. et Rchb. f.*
35. Eulophia graminea, *Lindl. Gen. et Sp. Orch.* p. 182.
36. —— andamensis, *Rchb. f. in Flora*, 1872, p. 276.
37. —— bracteosa, *Lindl. Gen. et Sp. Orch.* p. 180.
38. Cyrtopera Macrobulbon, *Par. et Rchb. f.*
39. Cymbidium tigrinum, *Par. Bot. Mag.* t. 5457.
40. —— Parishii, *Rchb. f.*
41. Phalænopsis Lowii, *Rchb. f. in Bot. Zeit.* 1862, p. 214.
42. —— Parishii, *Rchb. f. in Gard. Chron.* 1865, p. 410.
43. —— Wightii, *Rchb. f. in Bot. Zeit.* 1862, p. 214.
44. Trichoglottis Dawsoniana, *Rchb. f. in Gard. Chron.* 1872, p. 699.
45. Cottonia Championi, *Lindl. in Hook. Kew Journ.* vii. p. 35.
46. Luisia brachystachys, *Lindl.*, β. flaveola, *Par. et Rchb. f.*
47. —— platyglossa, *Rchb. f. in Walp. Ann.* vi. p. 622.
48. —— Psyche, *Rchb. f. in Bot. Zeit.* 1863, p. 38.
49. —— primulina, *Par. et Rchb. f.*

50. Vanda Bensoni, *Veitch, Rchb. f. in Gard. Chron.* 1867, p. 180; *Batem. in Bot. Mag.* t. 5611 (nomine nostro usuto).
51. —— Parishii, *Rchb. f. Xenia*, ii. p. 138; *Gard. Chron.* 1870, p. 800.
52. Renanthera succosa, *Lour. Fl. Cochi.* ii. p. 537. (On one of the Moscos Islands opposite Tavoy. Never seen on the mainland.)
53. —— bilinguis, *Rchb. f. Xenia*, i. p. 7, t. 4.
54. Cleisostoma lanatum, *Lindl. in Journ. Hort. Soc.* iv. p. 184.
55. —— Wendlandorum, *Rchb. f. in Seem. Bonpl.* iii. p. 219; Pomatocalpa spicatum, *Kuhl et v. Hass. Orch.* tab. xv.? (tum analysis erant caricatura).
56. Camarotis obtusa, *Lindl. Bot. Reg.* xxx. *Misc.* 71.
57. Sarcanthus laxus, *Rchb. f. in Bot. Zeit.* 1856, p. 378.
58. —— densiflorus, *Par. et Rchb. f.*; Saccolabium densiflorum, *Lindl. Gen. et Sp. Orch.* p. 220.
59. —— oxyphyllus, *Wall. in Lindl. Bot. Reg.* xxvi. *Misc.* 123.
60. —— insectifer, *Rchb. f. in Bot. Zeit.* 1857, p. 159.
61. —— erinaceus, *Rchb. f. in Bot. Zeit.* 1864, p. 298.
62. —— Williamsoni, *Rchb. f. in Hamb. Gart. Zeit.* 1865, p. 353, *et in Gard. Chron.* 1865, p. 674.
63. —— teretifolius, *Lindl. Gen. et Sp. Orch.* 234; Aërides appendiculatum, *Lindl. l. c.* 242.
64. Saccolabium Griffithii, *Par. et Rchb. f.*
65. —— buccosum, *Rchb. f. in Gard. Chron.* 1871, p. 938.
66. —— bipunctatum, *Par. et Rchb. f.*
67. Thrixspermum leopardinum, *Par. et Rchb. f.*
68. —— teres, *Rchb. f. Xenia*, ii. p. 121.
69. —— luniferum, *Rchb. f. in Gard. Chron.* 1868, p. 786.
70. —— arachnites, *Rchb. f. Xenia*, x. p. 121.
71. —— hystrix, *Rchb. f.*? (Dendrocolla hystrix, *Blume, Bijd.* p. 291.)
72. Aërides crassifolium, *Par. et Rchb. f.*
73. —— Wightianum, *Lindl. Gen. et Sp. Orch.* p. 238.
74. Aërides fallerum, *Wall., Lindl. Gen. et Sp. Orch.* p. 242.
75. Thelasis pygmæa, *Lindl. in Journ. Linn. Soc.* iii. 63.
76. —— carinata, *Bl. Bijdr.* p. 253.
77. Agrostophyllum planiramis, *Rchb. f. in Walp. Ann.* vi. p. 209.
78. Podochilus cultratus, *Lindl. Gen. et Sp. Orch.* p. 234.
79. —— luteescens, *Bl. Bijdr.* p. 295, t. 12. secundum *Lindl.*
80. —— microphyllus, *Lindl. Gen. et Sp. Orch.* p. 234.
81. Geodorum candidum, *Lindl. Fol. Orch. Geodorum*, n. 8.
82. —— pictum, *Jacks. in Bot. Rep.* t. 626.
83. —— citrinum, *Jacks.*, β. albidopurpureum, *Par. et Rchb. f.*

4. Epidendreæ.

84. Pachystoma Wightii, *Rchb. f. Walp. Ann.* vi. p. 464.
85. Sunipia scariosa, *Lindl. Gen. et Sp. Orch.* p. 179.
86. Coelogyne spiculata, *Rchb. f. Walp. Ann.* vii. p. 221.
87. —— ovalis, *Lindl. Gen. et Sp. Orch.* p. 42.
88. —— ochracea, *Lindl. Bot. Reg.* 1846, t. 69. subsp. ramosa, *Par. et Rchb. f.*
89. —— graminifolia, *Par. et Rchb. f.*
90. —— lentiginosa, *Lindl. Fol. Orch.* Cœlog. n. 4.
91. —— prolifera, *Lindl. Gen. et Sp. Orch.* p. 40.
92. —— rigida, *Par. et Rchb. f.*
93. —— undulata, *Par. et Rchb. f.*
94. —— ovalis, *Lindl. Bot. Reg.* 1838; *Misc.* p. 171.
95. —— Cumingii, *Par. et Rchb. f.*
96. —— Schilleriana, *Rchb. f. in K. Koch. Berl. Allg. Gart. Zeit.* 1858, p. 189.
97. —— pumila, *Lindl. Gen. et Sp. Orch.* 20; C. Wallichiana, *Lindl. Fol. Orch.* Cœl. 42.
98. —— (Pholidota) Convallariæ, *Rchb. f. in Flora*, 1872, p. 277.
99. —— (Otochilus) porrecta, *Rchb. f. in Walp. Ann.* vi. p. 236.
100. Dendrochilum pallidiflavens, *Bl. Bijdr.* p. 398.
101. Eria Pleurothallis, *Par. et Rchb. f.*

102. Eria extinctoria, *Hook. f. Bot. Mag.* t. 5910.
103. —— Parishii, *Lindl. et Rchb. f.*
104. —— natulata, *Par. et Rchb. f.*
105. —— dasyphylla, *Par. et Rchb. f.*
106. —— Ania, *Rchb. f. in Walp. Ann.* vi. p. 270.
107. —— fragrans, *Rchb. f. in Bot. Zeit.* 1864. p. 415.
108. —— hologlossa, *Par. et Rchb. f.*
109. —— muscicola, *Lindl.*
110. —— perpusilla, *Par. et Rchb. f.*
111. —— elongata, Griff. *Lindl. in Journ. Linn. Soc.* iii. p. 49.
112. —— pannea, *Lindl. Bot. Reg.* 1842, *Misc.* p. 79.
113. —— sicaria, *Lindl. in Journ. Linn. Soc.* p. 50.
114. —— pulchella, *Lindl. Bot. Reg.* 1841, *Misc.* p. 106.
115. —— obesa, *Lindl. Gen. et Sp. Orch.* p. 68.
116. —— acervata, *Lindl., Paxt. Fl. Gard.* i. p. 170.
117. —— affinis, *Griff. Notul.* iii. p. 297.
118. —— myristicæformis, *Hook. Bot. Mag.* t. 5415.
119. —— Eriopsidobulbon, *Par. et Rchb. f.*
120. —— concolor, *Par. et Rchb. f.*
121. —— convallarioides, *Lindl. Gen. et Sp. Orch.* p. 10.
122. —— dasypus, *Rchb. f. in Bot. Zeit.* 1864, p. 416.
123. —— Griffithii, *Rchb. f. Xenia*, ii. p. 163.
124. —— floribunda, *Lindl. Bot. Reg.* 1840, *Misc.* p. 56.
125. —— ringens, *Rchb. f. in Bonpl.* 1855, p. 222.
126. —— pumila, *Lindl. Gen. et Sp. Orch.* p. 68.
127. —— merguensis, *Lindl. in Journ. Linn. Soc.* iii. p. 52.
128. Cryptochilus meirax, *Par. et Rchb. f.*

5. Malaxideæ.

129. Dendrobium accrosum, *Lindl. Bot. Reg.* 1841, *Misc.* p. 86 (D. subteres, *Lindl. in Journ. Linn. Soc.* iii. p. 4).
130. —— atropurpureum, *Miq. Fl. Ind. Bat.* iii. p. 644.
131. —— terminale, *Par. et Rchb. f.*
132. —— eulophotum, *Lindl. in Journ. Linn. Soc.* iii. p. 4.
133. Dendrobium multiflorum, *Par. et Rchb. f.*
134. —— serra, *Lindl. in Journ. Linn. Soc.* iii. p. 3.
135. —— anceps, *Sw. in A. A. Holm.* 1800, p. 246.
136. —— pachyglossum, *Par. et Rchb. f.*
137. —— bambusæfolium, *Par. et Rchb. f.*
138. —— Findleyanum, *Par. et Rchb. f.*
139. —— Parishii, *Rchb. f. in Bot. Zeit.* 1863, p. 236; *Bateman, in Bot. Mag.* t. 5488.
140. —— gratiosissimum, *Rchb. f. in Bot. Zeit.* 1865, p. 99.
141. —— Devonianum, *Paxt. Mag.* i. p. 169, β. rhodoneurum, *Rchb. f. in Gard. Chron.* 1868, p. 682.
142. —— scabrilingue, *Lindl. in Journ. Linn. Soc.* iii. p. 15.
143. —— crumenatum, *Sw. in Act. Holm.* 1800, p. 246.
144. —— revolutum, *Lindl. Bot. Reg.* 1840, *Misc.* p. 110.
145. —— capillipes, *Rchb. f. in Gard. Chron.* 1867, p. 897.
146. —— luteolum, *Bateman, in Bot. Mag.* t. 5441.
147. —— senile, *Par. in Gard. Chron.* 1865, p. 414.
148. —— dixanthum, *Rchb. f. in Gard. Chron.* 1865, p. 674.
149. —— angulatum, *Lindl. Gen. et Sp. Orch.* p. 76.
150. —— cuspidatum, *Wall.*, *Lindl. Bot. Reg.* 1841, *Misc.* p. 7.
151. —— peguanum, *Lindl. in Journ. Linn. Soc.* iii. p. 19.
152. —— pycnostachyum, *Lindl. in Journ. Linn. Soc.* iii. p. 19.
153. —— bicameratum, *Lindl. Bot. Reg.* 1839, *Misc.* p. 85 (D. breviflorum, *Lindl. in Journ. Linn. Soc.* iii. p. 14).
154. —— incurvum, *Lindl. in Journ. Linn. Soc.* iii. p. 18.
155. —— Fitchianum, *Batem. in Bot. Mag.* t. 5444 (*sub* D. barbulato *obiter*; *cfr. Hook. f. Bot. Mag.* t. 5918).
156. —— moschatum, *Wall. Pl. As. Rar.* ii. p. 83, t. 195.
157. —— Dalhousianum, *Paxt. Mag.* xi. p. 145.

158. Dendrobium ciliatum, *Par. in Bot. Mag.* t. 5430.
159. —— xanthophlebium, *Lindl. in Gard. Chron.* 1857, p. 268.
160. —— Jamesianum, *Rchb. f. in Gard. Chron.* 1869, p. 551.
161. —— draconis, *Rchb. f. in Bot. Zeit.* 1862, p. 214.
162. —— infundibulum, *Lindl. in Journ. Linn. Soc.* iii. p. 16.
163. —— cumulatum, *Lindl. in Gard. Chron.* 1855, p. 756.
164. —— parcum, *Rchb. f. in Gard. Chron.* 1866, p. 1042.
165. —— Cœlogyne, *Rchb. f. in Gard. Chron.* 1871, p. 136.
166. —— pumilum, *Roxb. Pl. Ind.* iii. p. 479.
167. —— fugax, *Rchb. f. in Gard. Chron.* 1871, p. 1287.
168. —— densiflorum, *Lindl. in Wall. Pl. As. Rar.* 34, t. 40.
169. —— Chrysocrepis, *Par. et Rchb. f. in Bot. Mag.* t. 6007.
170. Bulbophyllum oblongum, *Rchb. f. in Walp. Ann.* vi. p. 349.
171. —— pictum, *Par. et Rchb. f.*
172. —— nasutum, *Rchb. f. in Gard. Chron.* 1871, p. 1482.
173. —— Lobbii, *Lindl.*, β. siamense, *Rchb. f. in Saunders's Refugium, ined.*
174. —— macranthum, *Lindl. Bot. Reg.* 1844, t. 13.
175. —— capillipes, *Par. et Rchb. f.*
176. —— moniliforme, *Par. et Rchb. f.*
177. —— penicillium, *Par. et Rchb. f.*
178. —— lemniscatum, *Par. in Bot. Mag.* t. 5961.
179. —— lemniscatum, β. tumidum, *Par. et Rchb. f.*
180. —— alcicorne, *Par. et Rchb. f.*
181. —— xylophyllum, *Par. et Rchb. f.*
182. —— khasyanum, *Griff. Notul.* p. 284.
183. —— sicyobulbon, *Par. et Rchb. f.*
184. —— cupreum, *Lindl. Bot. Reg.* 1838, *Misc.* p. 183; subsp. stenopetalum, *Par. et Rchb. f.*
185. —— parviflorum, *Par. et Rchb. f.*
186. —— auricomum, *Lindl. Gen. et Sp. Orch.* p. 50.
187. Bulbophyllum Lindleyanum, *Griff. Notul.* p. 287.
188. —— gracile, *Par. et Rchb. f.*
189. —— limbatum, *Par. et Rchb. f.*
190. —— triste, *Rchb. f. in Walp. Ann.* vi. 253.
191. —— odoratissimum, *Lindl. Gen. et Sp. Orch.* p. 55.
192. —— radiatum, *Lindl. Gen. et Sp. Orch.* p. 55.
193. —— stenobulbon, *Par. et Rchb. f.*
194. —— lasiochilum, *Par. et Rchb. f.*
195. —— pumilio, *Par. et Rchb. f.*
196. —— picturatum, *Rchb. f. in Walp. Ann.* vi. p. 262.
197. —— retusiusculum, *Rchb. f. in Gard. Chron.* 1869, p. 1182.
198. —— bootanense, *Par. et Rchb. f.*
199. —— Griffithianum, *Par. et Rchb. f.*
200. —— tripudians, *Par. et Rchb. f.*
201. —— merguense, *Par. et Rchb. f.*
202. —— Blepharistes, *Rchb. f. in Flora*, 1872, p. 278.
203. Drymoda picta, *Lindl. Sert. Orch.* p. 8.
204. Malaxis Myosurus, *Par. et Rchb. f.*
205. —— iridifolia, *Rchb. f. in Walp. Ann.* vi. p. 208.
206. —— ensiformis, *Sm. in Rees's Encycl.*
207. —— Griffithiana, *Rchb. f. in Walp. Ann.* vi. p. 208.
208. —— Brunoniana, *Rchb. f. in Walp. Ann.* vi. p. 209.
209. Liparis paradoxa, *Rchb. f. in Walp. Ann.* vi. p. 218.
210. —— paradoxa, *Rchb. f.*, β. flavida, *Par. et Rchb. f.*
211. —— Jovis-pluvii, *Par. et Rchb. f.*
212. —— stenoglossa, *Par. et Rchb. f.*
213. —— bistriata, *Par. et Rchb. f.*
214. —— Pachypus, *Par. et Rchb. f.*
215. —— spatulata, *Lindl. Bot. Reg.* 1840, *Misc.* p. 189.
216. —— condylobulbon, *Rchb. f. in Hamb. Gart. Zeit.* 1862, p. 34.
217. —— luteola, *Lindl. Gen. et Sp. Orch.* p. 32.
218. Microstylis Rheedii, *Lindl. Gen. et Sp. Orch.* p. 21.

219. Microstylis Wallichii, *Lindl. Gen. et Sp. Orch.* p. 20.
220. —— biloba, *Lindl. Gen. et Sp. Orch.* p. 20.

B. *CYPRIPEDIEÆ.*

221. Cypripedium concolor, *Par. in Gard. Chron.* 1865, p. 626.
222. Cypripedium villosum, *Lindl. in Gard. Chron.* 1854, p. 135.
223. —— Parishii, *Rchb. f. in Gard. Chron.* 1869, pp. 814, 1858.

Descriptions of new Species, and notes upon some of those described before.

I. Ophrydeæ.

3. Gymnadenia Helferi, Rchb. f. Flores purpurei, seu albi, seu albi purpureo striati, seu viridi-flavi. Labellum latum seu angustum.

4. Peristylus constrictus, Lindl. Florum sepala viridi-brunnea, reliqua organa eburneo-alba.

6. Peristylus Parishii, Rchb. f., tuberidiis maximis oblongis, caule valido pedali, vaginis amplis cucullatis, foliis 3–5 in medio caule rosulatis oblongis acuminatis, superne vaginis 2–3 abrupte bracteæformibus, racemo plurifloro nunc subsecundifloro, bracteis lanceolato-acuminatis ovaria superantibus, sepalis triangulis, petalis triangulis, labello medio trifido, laciniis triangulis, calcari globoso apiculato ovario pedicellato duas tertias ad dodrantem breviore. Planta sicca nigrita.

7. Habenaria pelorioides, Par. et Rchb. f., ultrapedalis, valida, caule calamum columbinum superante, foliis cuneato-oblongis acuminatis, tribus bene evolutis, vaginis in caule quinis in bracteas lineares acuminatas abeuntibus, racemo plurifloro densiusculo, bracteis flores inferiores æquantibus, sepalis semilanceis limbo microscopice ciliolatis, quinquenerviis, petalis ligulatis obtuse acutis brevioribus binerviis, labello cuneato lanceolato acuminato trinervi ecalcarato, cum petalis minute ciliolato, antheræ canalibus elongatis, cruribus stigmaticis productis parallelis.—*Amherst*, 1862.

Plate XXVII. I. *Habenaria pelorioides.* 1. Side view of flower. 2. Column, seen from above. 3. Side view of column, showing the insertion of sepals and lip over the base.

8. Habenaria tipulifera, Par. et Rchb. f., ultrabipedalis, tuberidiis oblongis, foliis in medio caule lineari-ligulatis acuminatis, ad 4, prope sex pollices longis, ultra unum pollicem latis, foliis bracteæformibus superne ad 2, racemo elongato plurifloro laxifloro usque pedali, bracteis triangulo-acuminatis ovaria pedicellata æquantibus, perigonio connivente, sepalo summo triangulo uninervi, sepalis lateralibus cuneatis ligulatis obtuse acutis, petalis ligulato-falcatis uninerviis, labello supra basin tripartito lamina transversa supra unguem, partitionibus lateralibus divaricatis setaceo-caudatis elongatis, partitione mediana lanceolata porrecta, anthera obtusa, calcari a basi constricta plus minus clavato tertiam partem ovarii æquante, canalibus juxta brachia stigmatica adnatis, brachiis stigmaticis cochleatis.

Obs. Huc omnino videtur pertinere *Glossula tentaculata*, Lindl., peraffinis speciei nostræ. Recedit rosula foliorum altius inserta, ovariis et calcari. Quæ laudantur ab ill. Lindley bursiculæ, has ego brachia stigmatica cochleato-convoluta habeo. Bursiculæ semper organa exigua, nunquam adeo speciosa, conspicua. Valde affinis est *Peristylus*

aristatus Lindl. !, a quo *P. exilis* Wight ! herb. non differt, dum icon t. 1698 plantæ nostræ similis, labelli lacinia media basi cornuta recedit, de qua descriptio Wightiana omnino silet.

9. Habenaria chlorina, Par. et Rchb, f., ultrabipedalis, validiuscula, tuberidiis a tenui basi stipitata oblongis obtusatis, vaginis baseos laxis, foliis evolutis ternis seu quaternis ligulatis acuminatis ad quinque pollices longis, duos pollices latis, foliis superioribus in bracteas abeuntibus, senis seu octonis, superioribus angusto-lanceolatis cuspidato-acuminatis, paulo imbricantibus racemo cylindraceo densifloro, bracteis tri-angulo-setaceis ovaria pedicellata inferiora attingentibus margine scabris, sepalo dorsali ovato acutiusculo tri- ad quinquenervi, sepalis lateralibus triangulis deflexis, quinquenerviis, petalis ligulato-falcatis binervibus, labelli tripartiti partitionibus lateralibus subulato-linearibus partitione media lineari paulo brevioribus, calcari a basi filiformi clavato ovario pedicellato tertia breviore, antheræ canalibus ultra crura stigmatica obtusata porrectis, staminodiis ligulatis.—Flores in alia icone Parishiana simpliciter flavo-virides, in alia icone ejusdem coloris et brunneo maculati. Primum sunt virides, dein paucimaculati, demum maculatissimi, tandem brunnei ex cl. Parish. Prope Wagroo.

Similis *H. acuiferæ*, Lindl., calcari multo longiore subæquali, nec abrupte clavato gaudet.

10. Habenaria digitata, Lindl. Sepala viridia. Sepalorum partitio superior viridis, inferior ac partitiones labelli virides, basi albæ. Ill. Bentham, Australasicas Orchideas describens, hanc ab *H. digitata*, Lindl., eo differre monet, quod partitiones petalorum in hac approximatæ in illa distantes. Ceterum *H. digitata* est planta microphylla, hæc macrophylla, platyphylla.

11. Habenaria spatulæfolia, Par. et Rchb. f., humilis, caule vix spithamæo, foliis spatulatis oblongis obtuse acutis ternis, usque pollicem latis, quatuor pollices longis, pedunculo basi mediove folio uno vaginiformi instructo, racemo uni- seu bifloro, bracteis ovatis acutis retinerviis ovarii pedicellati rostrati tertiam partem æquantibus, sepalo dorsali ovato acuto ventricoso cucullato, sepalis lateralibus obliquis ovatis acutis deflexis, petalis ligulato-falcatis obtuse acutis binerviis, labello supra basin tripartito, partitionibus filiformibus acuminatis, lateralibus . . . ., partitione mediana sepala lateralia superante, calcari filiformi apice valde clavato acuto ovario pedicellato sublongiore arcuato, anthera erecta gracili, canalibus elongatis, cruribus stigmaticis abbreviatis.—Similis *Habenariæ viduæ*, sed foliis, bracteis, inflorescentia biflora recedens, nec non scabritiei defectu ac petalorum figura diversa. Sepala lateralia etiam candida videntur. Labelli partitionum lateralium apices omnes deleti.

12. Habenaria vidua, Par. et Rchb. f., caule subpedali, foliis cuneato-ligulatis acuminatis approximatis evolutis quaternis, caule superne minute scabro papilloso, foliis in bracteas abeuntibus duobus, racemo novemfloro laxifloro, floribus porrectis, bracteis triangulis acuminatis seu elliptico-acuminatis quam ovaria pedicellata scabra bene rostrata quater brevioribus, sepalo dorsali ovato obtuso acuto cucullato, sepalis lateralibus triangulis demum convolutis retusis retrorsis, petalis triangulis binervibus obtusis,

labello tripartito partitionibus omnibus filiformibus acuminatis, lateralibus erectis, partitione mediana deflexa, antheræ canalibus elongatis, cruribus stigmaticis inferne canalibus adnatis, calcari filiformi apicem versus ampliato acuto ovario pedicellato sublongiore.—Occurrit floribus duplo minoribus. Icon Parishiana sepalum dorsale et petala offert alba, reliquas partes virides.

Plate XXVII. II. *Habenaria vidua.* 4. Flower, side view. 5. Sepal. 6. Lateral sepal. 7. Expanded lip. 8. Column, lateral sepal, and ovary, side view. 9. Column, seen above.

13. Habenaria corymbosa, Par. et Rchb. f., ultratripedalis, caule inferne calami cycnei crassitudine vaginis multis retusis, foliis evolutis cuneato-ligulatis acuminatis quinque pollices longis, plus unum pollicem latis, foliis in bracteas abeuntibus ad tredecim distantibus lanceolato-acuminatis, inflorescentia densissima superne corymbosa, bracteis lanceolato-acuminatis ovaria fusiformi-rostrata capillaceo-pedicellata haud æquantibus, sepalo dorsali oblongo acuto, sepalis lateralibus semioblongis acutis deflexis, petalis bipartitis, partitionibus lineari-setaceis, labelli tripartiti partitionibus lineari-subulatis, subæqualibus, antheræ erectæ canalibus porrectis, cruribus stigmaticis acutis porrectis, staminodiis ligulatis erectis.

II. Operculatæ.

1. Neottiaceæ.

17. Cheirostylis malleifera, Par. et Rchb. f., pusilla, vix tres pollices alta, tota calva, caule crassiusculo, foliis evolutis 3–5, vaginis amplis, petiolis bene brevioribus, laminis oblongis acutis, racemo paucifloro, bracteis triangulis acuminatis uninerviis ovario subæqualibus, sepalis anguste triangulis, lateralibus alte connatis, petalis falcatis obtuse acutis, labello oblongo ventricoso antice tridentato, dentibus lateralibus triangulis abbreviatis, dente mediano ligulato acuto porrecto, callis in fundo geminis manubrio brevissimo, callo ipso semilunato, malleiformibus, columnæ cuspidibus geneticis bene evolutis.—Simillima *Cheirostylidi parvifoliæ*, Lindl., quæ labelli indole ac pube ovarii recedit.

18. Cheirostylis pubescens, Par. et Rchb. f., bene spithamæa, foliis ad sex a basi seu supra basin aggregatis, vaginis amplis, petiolis tenuibus laminæ sextam æquantibus, laminis oblongo-lanceolatis acuminatis, pedunculo puberulo triangulato, vaginis parvis, racemo usque septemfloro, bracteis semilanceolatis ovaria pedicellata subæquantibus, ovariis calvis, sepalo dorsali obtuse galeato cum sepalis lateralibus altius connato, sepalis lateralibus alte coalitis bidentatis, petalis obtusangule dimidiatis, labelli basi ampliata utrinque lamella una serrata basi adnata ceterum incumbente, dein in unguem apice liberum supra laminam apicalem incumbente, lamina terminali divergenti biloba, lobis antrorsis subquadratis extus serratis, rostelli lobis ligulatis apice dilatatis, suppositis ligulis sursum apice angulato-dilatatis.

20. Anecochilus albolineatus, Par. et Rchb. f., humilis, carnosus, crassus, vaginis arctiusculis, petiolis brevibus lamina quinquies brevioribus, laminis oblongis acutis, sæpius obliquis, linea alba per medium et reti albo, pedunculo glandipili, squamis

in bracteas abeuntibus duas, bracteis cucullatis triangulis acuminatis ovaria superantibus, perigonio extus pilosulo, sepalis triangulis obtusis, petalis falcatis, calcari ovario pedicellato multo breviore acuto sulcato (hinc apicibus appositis geminis), labelli ungue marginibus involutis antice acuto inflexis, callis rhombeis serratis geminis in basi, lacinia antica utrinque setis ad sex elongatis, lamina anteriore trifida, lacinia media triangula minuta, laciniis lateralibus porrectis divaricatis dolabriformibus, columnæ lamella anteposita adnata forcipata, rostello bidentato.

22. Etæria moulmeinensis, Par. et Rchb. f., ultrapedalis, caule validiusculo, foliis sparsis, vaginis foliorum hyalinis amplis, petiolis angustis, laminis cuneato-oblongis, vaginis in caule superne glandipili tribus distantibus, racemo laxifloro rhachi et bracteis dorso et margine glandipilibus, bracteis ligulatis acuminatis uninerviis ovaria pedicellata calva haud æquantibus, sepalis triangulis acutis uninerviis, petalis dimidiato-semiovatis acutis uninerviis, labello basi ventricoso, isthmo canaliculato, apice acuto in portionem anticam expansam quadrato-bilobam extus denticulatam incumbente callis flabellatis duobus in fundo baseos ventricosæ, carina parva anteposita abrupta.

Huic speciei affines sunt tres :—

E. abbreviata, Lindl. Gen. et Sp. Orch. 481, quæ ungue (isthmo) ante labellum apice dilatatum bilobum optime recedit, sed eandem carinam et utrinque callum ostendit.

E. anomala, Lindl. in Journ. Linn. Soc. iii. 185, labelli parte posteriore humili, carina humillima (non lamellæformi) callo laciniato didymo utrinque et ungue ante labelli apicem involuto bene recedit. Præterea sepala extus et ovarium bene pilosa.

E. lanceolata (*Dossinia lanceolata*, Lindl. in Journ. Linn. Soc. iii. 186), nostræ quam maxime affinis, optime recedit lamellis in ventre geminis, quod jam in India accuratissime delineavit ill. J. D. Hooker.

23. Hæmaria discolor, Lindl., var. Dawsoniana, Rchb. f. Nuper cl. Blume *Ludisiæ* nomen utpote quod antiquius Lindleyano nomini prætulit. Hæc sunt documenta: In Dictionnaire classique d'Histoire Naturelle, viii. Févr. 1825, p. 456, sub *Goodyera*: "On a décrit récemment en Angleterre, sous le nom de *Goodyera discolor*, une autre plante, mais qui ne nous semble pas appartenir à ce genre. Elle en diffère surtout par son labelle non concave mais offrant à sa base une petite bourse bilobée, par son pollen dont les deux masses sont caudiculées et sans glandes. Nous pensons que cette espèce forme un genre nouveau, que nous décrirons sous le nom de *Ludisia*. V. ce mot." (A. R.) In vol. ix. tamen (1826), sub littera L, *Ludisia* non occurrit. Apud Lindley, Orchidearum sceletos, p. 9: "*Hæmaria* (*Godyera discolor*, Ker)," nomen tantum, sed in Endlicher, 'Genera,' p. 214 (1837) *Hæmaria*, Lindl., inseritur cum descriptione et in Lindley 'Genera et Species Orchidearum' (1840), p. 489, pariter adest cum descriptione. Ex his patet, "A. R." (Achille Richard) plantam stabilire voluisse, sed id non fecisse, eum dubium hæsisse. Ill. Lindley contra stricte genus proposuit. Inde genus Richardianum non accipiendum esse declaro, ut omnia illa genera hypothetice introducta.

2. Arethuseæ.

24. Pogonia velutina, Par. et Rchb. f., sequenti elatior, folio amplo cordato elliptico acuto utrinque hispido, pedunculo subspithamæo, vulgo bifloro, vaginis quaternis amplis

cucullatis acutis, bractea triangula minutissima pedicellum ovarii bene evolutum vix æquante, floribus nutantibus seu porrectis magnis, sepalis petalisque cuneato-lineari-lanceolatis, labello circa columnam voluto oblongo obtusiusculo sepalis subbreviore seu breviore, columna valida clavata.—Flores magni ultra pollicem longi, purpureo-virides. Labellum album nervis purpureis lineaque mediana fulva.

26. Pogonia maculata, Par. et Rchb. f., parvula, folio reniformi-elliptico acuto sinuato nigromaculato, pedunculo quadrivaginato, racemo unifloro seu bifloro, bracteis triangulis minutis, floribus nutantibus, sepalis petalisque lineari-lanceolatis, sepalis lateralibus in mentum minutissimum productis, labello rhombeo acuto utrinque medio unidentato omnino lævi, columna clavata.—Folia ex pictura Parishiana obscure viridia, maculis in disco atropurpureis in plicis inter angulos. Flores virides, labelli nervi obscurius virides. Columnæ apex purpureus.

3. Vandeæ.

30. Monomeria Crabro, Par. et Rchb. f. Videtur generis species primaria in paucissimis herbariis reperiri et nonnisi ex distributione Wallichiana. Sine dubio exstat in herbario Wallichiano. Ego vidi in herbario Lindleyano et Hookeriano et tandem duo ipse exemplaria obtinui ex collectione Wallichiana, quæ nunc mea, olim domini Maille Parisiensis erat. Omnia specimina flores gerunt, qui examini haud idonei, forsan aquæ fervidæ quondam immissi. Ill. Lindley petala nulla reperit, sed ex icone Wallichiana (Sertum Orchidaceum, Frontispiece) seriem dentium parvorum pingere jussit dominam Drake. Ego tandem ipsissima petala in flore Wallichianæ plantæ reperi, dum jam prius Rev. Parish in illa planta, quam prope Taok, Februario 1871, unicam legit, eadem organa indicavit. Idem vir oculatissimus apparatum pollinicum detexit valde diversum ab illo, quem ill. Lindley noster in mancis floribus reperit. Adsunt pollinia quaterna subparallela, caudicula rigida linearis, atque glandula bene separabilis. Hinc planta vere *Maxillariis* affinis evadit. Diagnoses utriusque speciei hic edo.

Monomeria barbata, Lindl. Gen. et Sp. Orch. p. 61, pseudobulbis cylindraceis monophyllis, foliis petiolatis oblongo-ligulatis (ultra 2″ latis) apice amplis bilobis, pedunculis erectis plurifloris, ovariis pedicellatis prope semipollicaribus, petalis semiovatis fimbriatis latis, labelli carinis multicrenatis, columnæ pede curvo.

(*Dendrobium tripetaloides*, Roxb., quod in herbario Lindleyano huc ducitur, ex icone authentica in herbario Kewensi asservata est *Bulbophyllum auricomum*, Lindl.)

Monomeria Crabro, pseudobulbis pyriformibus monophyllis, foliis petiolatis oblongo-ligulatis ($1\frac{1}{3}$″ latis) apice attenuatis bilobis, pedunculo plurifloro porrecto, ovariis pedicellatis pollicaribus, petalis triangulis fimbriatis angustis, labelli carinis integerrimis, columna recta.

Planta hæc rhizoma videtur habere longe scandens illi *Bulbophylli Blepharistidis*, Rchb. f., æquale. Folium ultrapedale. Pedunculus longior, basi vaginis paucis luridis, superne violaceus, multiflorus. Bracteæ ovariis pedicellatis plus triplo breviores. Sepalum dorsale ovato-triangulum, acuminatum, citrinum, extus violaceo-tristriatum. Sepala lateralia oblongo-ligulata, apice introrsum obliqua, acuta, vulgo parallela contigua,

flava, maculis violaceis. Sepala flava, apice violaceo-marginata. Labellum violaceum, margine laminæ flavum. Columnæ utrinque limbo curvo apice acuto.

Plate XXVIII. 1. Side view of flower. 2. Anterior view of column with petals. 3. Pollinarium, from Rev. Parish's drawing. 4. Bud. 5. The same, lateral sepal taken away for showing column, petal, and lip. 6. Lip, seen from above. 7. Lip, seen from underneath. 8. Column and anther fallen. From Dr. Reichenbach's sketches.

31. THECOSTELE ALATA, Par. et Rchb. f. Ex icone Rev. Parishii, pseudobulbi breviter ovoidei costati, valde aggregati. Pedunculus pendulus. Perigonia albida, hinc flavo-lineata, maculis purpureis.

Plate XXIX. 1. Parts of flower, seen from above. 2. Side view of flower, sepals and petals absent. 3. Lip, front view. 4. Top of column. 5. The same, oblique view. 6. Anther. 7. Pollinarium.

34. CALANTHE BILOBA, Lindl., β. OBTUSATA, Par. et Rchb. f., labelli laciniis anticis obtusis. Ex icone Parishiana sepala et petala brunneo-atropurpurea, labelli lacineæ laterales disco flavæ, nervis brunneis.—Planta major quam Sikkimensis.

38. CYRTOPERA MACROBULBON, Par. et Rchb. f., pseudobulbis subsphæricis, foliis oblongis acuminatis, pedunculo validissimo, basi vaginis paucis approximatis, medio squamis quibusdam lineari-setaceis bracteæformibus, apice longe racemoso, bracteis lineari-setaceis, ovaria pedicellata æquantibus seu superantibus, sepalis ligulatis acuminatis, petalis cuneato-ovatis acutis, labelli mento obtusangulo conico bene producto, lamina oblonga apice triloba, lobo medio obtuso longiore supra discum asperulo et pilosulo, lobis lateralibus obtusangulis bene brevioribus, antheræ vertice appendice semiovata.—Sepala et petala brunnea. Labellum flavidum, maculis in loborum discis rufis. Columna alba, anthera purpurea.

40. CYMBIDIUM PARISHII, Rchb. f., juxta *C. eburneum*, foliis ligulato-linearibus acutis, pedunculo paucifloro ad tri-floro, vaginis scariosis lanceolo-falcatis acuminatis, floribus magnis, sepalis oblongo-ligulatis acutis, petalis oblongo-ligulatis acutis, labello a basi angusta flabellato-dilatato, antice trifido, laciniis lateralibus oblongis acutis antrorsis, lacinia media cuneato-ovata acuta undulata sericeo-tecta ac sericeo-fimbriata, callo in disco antico bilobo cum apiculo utrinque sericeo-villoso.—Prope *C. eburneum*, Lindl., quo paulisper minus. Dum hæc scribo habeo ad manus typos Lindleyanos (Myrung, Griffith) et flores ex horto Veitchiano. Bracteæ in hoc nunc longiores, petala semper longiora, acuminata. Bene recedere videtur callo ac pube ac laciniarum figura. Labellum album purpureo-striatum ac maculatum.—Meritissimo cl. Parish dicatum, certe pulcherrimum omnium *Cymbidiorum*.

46. LUISIA BRACHYSTACHYS, Lindl., β. FLAVEOLA, Par. et Rchb. f., floribus flavis, hypochilii disco toto purpureo, striis in labello purpureis. (Ex icone Parishiana.)

47. LUISIA PLATYGLOSSA, Rchb. f., sepala atropurpureo irrorata. Petala flavida, purpureo aspersa. Labellum flavum.

49. LUISIA PRIMULINA, Par. et Rchb. f., validissima, foliis teretibus crassis paucis, racemis paucifloris, sepalis oblongo-triangulis brevibus, petalis cuneato-oblongis obtusis acutisve, hypochilio carnoso sellæformi parvo, epichilio triangulo basi obtusangulo,

antice hinc lobato obtuso.—Flores ochroleuci. Hypochilium violaceum. Glandula basi lunata.

Plate XXX. I. *Luisia primulina*. 1. Flower. 2. The same, side view. 3. Column and base of lip, side view. 4, 5. Pollinaria.

64. Saccolabium Griffithii, Par. et Rchb. f., vultu *Angræci distichi*, Lindl., caulibus erectis seu ascendentibus densissime distiche foliatis, foliis ancipitibus triangulis utrinque paulo obtusangulis, racemis unifloris axillaribus paucivaginatis, sepalis petalisque ligulatis acutis, labello pandurato acuto, calcari saccato brevi.—Specimina paucos pollices alta. Folia 2–3‴ longa, 1½‴ lata. Flores candidi, minuti. Juxta specimina sicca et iconem b. Griffith in herb. Lindl.

66. Saccolabium bipunctatum, Par. et Rchb. f., caule gracilento radicante superne foliato, foliis lineari-ligulatis apice inæquali bidentatis ad 5″ longis, ⅓″ latis, pedunculis subbifloris brevissimis, sepalis petalisque lineari-falcatis, labello trifido laciniis lateralibus ligulatis obtusis valde abbreviatis, lacinia media ligulata acuta longe producta, calcari brevi saccato, callo in fundo inter lacinias, callo membranaceo superne denticulato utrinque in fundo.—Sepala et labellum ad 3‴ longa. Sepala et petala flava. Labellum album. Laciniæ laterales purpureo prætextæ. Calcar viride (colores ad ic. Par.).

67. Thrixspermum leopardinum, Par. et Rchb. f., caule ascendente validiusculo, radicibus aëriis plurimis, foliis cuneato-ligulatis apice inæqualiter bilobis, ad 6″ longis, ⅔–⅘″ latis, racemis abbreviatis, folia prima anthesi non dimidio æquantibus, rhachi compressa, bracteis triangulis, ovariis pedicellatis bene brevioribus, sepalis triangulis, petalis paulo angustioribus, labelli laciniis lateralibus anguste triangulis obtusis, lacinia media carnosa rotundula multo breviore, gibbere didymo superposito, calcari clavato oblongo acuto multo longiore.—Perigonium ex icone Parishiana flavum maculis purpureis. Labelli laciniæ laterales ejusdem coloris, lacinia media alba, maculis purpureis. Calcar cylindraceum album.

71. Thrixspermum hystrix, Rchb. f. ? Eadem planta adest in herbario Lindleyano. Mergui, Griffith n. 1066 !

72. Aërides crassifolium, Par. et Rchb. f., valde affine *Aëridi falcato*, Lindl., sed recedere visum foliis crassis abbreviatis apice inæquali bilobis nec pergameneis elongatis, labelli partitionibus lateralibus latioribus, partitione mediana expansa ecarinata. Florum color demum in hac specie rufo-purpureus, labelli lacinia media obscurior. Calcar flavidum, apice viride.

75. Thelasis pygmæa, Lindl. Dense cæspitosa. Pedunculi vaginæ ac bracteæ intense brunneæ; flores viriduli.

79. Podochilus lucescens, Blume, saltem Lindl. Labellum candidum, apice maculis paucis purpureis.

83. Geodorum citrinum, Jacks. in Bot. Rep. t. 686, β, albido-purpureum, Par. et Rch. f., foliis melius petiolatis, floribus albido-flavis, labello purpureo disco flavido. callis in labello nullis.

4. Epidendreæ.

87. Cœlogyne (Erectæ) uniflora, Lindl. Gen. et Sp. Orch. 43. *C. biflora*, Parish, Gard. Chron. 1865, p. 1035. *Epidendrum*, Griff. Posth. Pap. tab. cccxiii. Felicissime nuper cl. Parish indigitavit, hanc bifloram veram esse *Cœlogynem unifloram*, Lindl., et quidem conductus colore labelli. Basin labelli ab ill. Lindley haud bene visam esse dentes laterales in ipsissimo herbarii specimine typico demonstrant.

88. Cœlogyne (Erectæ) ochracea, Lindl., subsp. conferta, Par. et Rchb. f., humilis, compacta, pseudobulbis pyriformi-conicis, foliis petiolatis oblongo-acutis geminis, pedunculis tota basi vaginis nitidis obtectis apice plurifloris, bracteis oblongo-ligulatis ovaria pedicellata longe excedentibus, sepalis petalisque ligulato-lanceolatis acuminatis, labello trifido, laciniis lateralibus rectangulis, lacinia antica elliptica acuta, carinis per discum ternis cruribus basi angulatis, lateralibus extrorsum exsilientibus.—Forsan propria species, sed characteres ad separandam speciem idonei nulli in promptu, nisi forsan ovaria pedicellata adeo brevia, quod tamen et dispositione loci explicari potest. Color florum ex icone Parishiana exacte talis, qualis in Lindl. Bot. Reg. 1846.

Plate XXX. II. *Cœlogyne ochracea.* 6. Flower, side view. 7. Lip. 8. The same, expanded.

89. Cœlogyne (Erectæ) graminifolia, Par. et Rchb. f., pseudobulbis seriatis pyriformi-ligulatis costatis diphyllis, foliis linearibus acuminatis valde strictis, racemis basi a vaginis contectis ante pseudobulbi formationem paucifloris (3) erectis, bracteis anthesi dejectis, sepalis lanceolatis, petalis linearibus acutis, labello trifido, laciniis lateralibus obtusangulis, lacinia media cuneato-ovata acuta, carinis geminis per longitudinem incrassatis, interposita antice carinula incrassata tertia.

90. Cœlogyne (Erectæ) lentiginosa, Lindl. (Hook. Bot. Mag. t. 5958). A simili *C. trinervi*, Lindl., energetice differt carinis ancipitibus rectis, nec plicatis.

92. Cœlogyne (Proliferæ) rigida, Par. et Rchb. f., pseudobulbis approximatis oblongis ancipitibus, hinc costatis diphyllis, foliis petiolatis lato-oblongis acutis ultraspithamæis duos pollices latis, pedunculis nudis, sub inflorescentia pauciflora stricta seu fractiflexa distiche vaginatis, sepalis triangulis, petalis filiformi-linearibus, labello basi subsaccato trifido, laciniis lateralibus erectis obtusangulis, lacinia media cuneata elliptica biloba, carinis geminis plicatis per discum carina tertia parvula interposita.—Flores illis *Pholidotarum* valde similes, vix ultra dimidium pollicem longi, pallide ochracei, labelli carinis fusco prætextis.

93. Cœlogyne (Proliferæ) ustulata, Par. et Rchb. f., rhizomate brevi, pseudobulbis aggregatis fusiformi-ovoideis diphyllis, foliis petiolatis ovatis acutis, pedunculo gracili sub racemo paucifloro, vaginis distichis brevibus, bracteis ovatis obtuse acutis flores subæquantibus, sepalis ligulatis acutis, petalis linearibus, labello trilobo, lobis lateralibus semiovatis, lobo medio retuso lobulato, carinis geminis obscuris per discum, columna apice ampliata.—Pseudobulbi sesquipollicares. Folia duos pollices longa, duas pollicis tertias lata. Flores minuti illis *Cœlogynes micranthæ* subæquales. *Cœlogyne*

flavida satis recedit foliis, pseudobulbis aggregatis, &c. Flores ex icone Parishiana flavidi, brunneo prætexti.

95. Cœlogyne (Filiferæ) Cycnoches, Par. et Rchb. f., pseudobulbis cylindraceis brevibus dense seriatis diphyllis, foliis cuneato-oblongo-ligulatis acuminatis, racemo paucifloro anthesi bracteato, bracteis spathaceis ovaria pedicellata superantibus, sepalis lineari-ligulatis, petalis linearibus, labello trifido, laciniis lateralibus antrorsum acutis, lacinia media ab isthmo brevi cordata transverse ovata acuta, carinis per discum ternis depressis in basi laciniæ anticæ dilatatis.

Affinis *Cœlogynæ brunneæ*, a qua bene recedit ipsa statura duplo minore, bracteis anthesi persistentibus, carinarum indole inæquali, floribus viridibus fusco prætextis. Labelli dimidium superius viride, dimidium anticum albidum brunneo pictum.

101. Eria (Conchidium) Pleurothallis, Par. et Rchb. f., pseudobulbo minutissimo a vaginis tecto, monophyllo, folio petiolato oblongo triangulo apice inæquali obtuse bidentato coriaceo, pedunculo capillari unifloro elongato laterali sericea villoso, bractea acuta ovarium pedicellatum æquante, sepalis ligulato-triangulis trinerviis pilosulis, lateralibus (supremis!) basi saccata obtusangulis, petalis linearibus, labello ligulato antice trilobo, lobis lateralibus obsolete angulatis, lobo antico transverse trilobulo, carinis obsoletis geminis ante lobum anticum.—Pusilla. Folia vix duos pollices longa. Pedunculus vix $\frac{2}{3}$ pollicis longus. Flos illo *Eriæ floribundæ*, Lindl., adhuc minor. Ex icone Parishiana flores candidi striis purpureis. Labellum album lobo antico flavo. Striæ in labello purpureæ.

Plate XXX. III. *Eria Pleurothallis*. 9, 10. Flowers. 11. Upper sepal. 12. Sepal. 13. Lip, seen from above. 14. Lip, side view. 15. Column, side view. 16. Anther-case, underside. 17. Pollinarium.

103. Eria (Conchidium) Parishii, Lindl. & Rchb. f., affinis *Eriæ Jerdonianæ*, Lindl., pseudobulbis depresso-sphæricis minutis, vaginis demum in rete solutis, foliis geminis ovatis acutis margine ciliatis, racemis sessilibus unifloris seu bifloris, mento obtuso tumido, sepalis triangulis, lateralibus alte coalitis extus prope calvis, petalis linearibus trinerviis, labello ligulato acuto brevissimo.—Perigonium ex icone Parishiana testaceum basibus atro-brunneis.

104. Eria (Conchidium) ustulata, Par. et Rchb. f., affinis *Eriæ Jerdonianæ*, Lindl., pseudobulbis depresso-sphæricis, vaginis in rete fasciculorum vasorum demum solutis, foliis in pseudobulbis juvenibus geminis ovatis acutis abbreviatis ciliatis et hinc asperulo-papulosis, racemo sessili nunc bifloro, perigonio extus hispido, sepalo summo triangulo acuminato, sepalis lateralibus basi saccatis, apice liberis, dentibus uncinatis deorsum versis, petalis lanceolato-falcatis trinerviis, labello oblongo-acuto undulato, umbone in ipsa basi.—Flores ex icone Parishiana atro-brunnei.

105. Eria (Conchidium) dasyphylla, Par. et Richb. f., rhizomate repente, omnibus vaginis hispidis, foliis spatulatis obtuse coriaceis pilosis geminis nunc solitariis, pedunculo exserto hispido apice bracteato, bractea ovarium hispidum longe non æquante, mento obtuso, sepalo summo angusto triangulo, sepalis lateralibus multo majoribus, petalis ligulatis acutis, labello rhombeo retuso obtusangulo, columna obtusa.

Planta a me semper pro *Bulbophyllo* habita, uti ab ill. Lindley, donec cl. Parish pollinarium inspexit. *Acrosticho minuto* comparabile. Folia carnosa a Parish dicuntur. Near Henzai-basin, also road to Meta-Tavoy, *Parish.*—Mergui, 18 Jul. 1818; Leonga river on *Mangifera*, Helfer (*hb. Hook.*!); Sikkim, *Dr. Hooker*! *Kurz*!

108. Eria (Ania) hologlossa, Par. et Rchb. f., toto habitu simillima *Eriæ bicorni*, Rchb. f., racemo sublaxiore, bracteis triangulis ovaria pedicellata longe non æquantibus, sepalis lineari-ligulatis acutis, petalis subæqualibus, labello ecalcarato oblongo, obtuso utrinque ante medium nunc minute angulato, carinis ternis per discum lateralibus plicatis, carina mediana longiore subrecta, antheræ vertice inornato.

109. Eria (Muscicolæ) muscicola, Lindl. in Journ. Linn. Soc. iii. 47. Huc refero Parishianam plantam ob apicem cuspidatum recurvum labelli, sed vix crediderim *Eriam Dalzelli*, Lindl., vere esse diversam.

110. Eria (Phreatia) perpusilla, Par. et Rchb. f., pseudobulbis depresso-sphæricis costatis, pedunculis ex caulibus novellis basi vaginatis gracilibus teretiusculo-filiformibus bivaginatis, vaginis brevibus triangulo-ochreatis apice racemosis (racemis nunc nutantibus ?), bracteis scarioso-membranaceis triangulis uninerviis, mento modico, perigonio tenuissimo, sepalis triangulis uninerviis, petalis lineari-falcatis uninerviis, labello lineari-ligulato uninervi basi subsaccata.—Flores albi uti crystalla sacchari. Columna et ovarium viridia. Etiam a Lobbio in herb. Lindl.

119. Eria (Hymeneria) Eriopsidobulbon, Par. et Rchb. f., pseudobulbis oblongis minutissime insculpto-rugosis, junioribus basi vaginis 6 membranaceis foliisque 2–3 ligulatis acutis quintam ovarii pedicellati puberuli partem subæquantibus, mento obtusangulo, sepalis petalisque falcatis acutis, sepalis extus pubescentibus, labello a cuneata basi medio trifido, laciniis lateralibus angulato-falcatis, isthmo angustissimo, lacinia antice cordato-obreniformi cum apiculo in sinu.

120. Eria (Hymeneria) concolor, Par. et Rchb. f., pseudobullbis cylindraceo-abbreviatis (3″ altis) paucifoliis, foliis membranaceis ligulatis acutis, racemis lateralibus ad quinquefloris, rhachi parce pilosula, bracteis ovatis acutis ciliolato-dentatis ovaria pedicellata dimidia scabrula haud æquantibus, mento obtusangulo, sepalo dorsali ligulato acuto, sepalis lateralibus triangulis, petalis linearibus acutiusculis, labello trifido, laciniis lateralibus anticis obtusato-rectangulis, lacinia antica porrecta ligulata retuso-emarginata tota incrassata, carinis incrassatis ternis a basi in basin laciniæ anticæ.—Flores illis *Eriæ Griffithii*, Rchb. f., æquales, ex icone Parishiana flavidi. Labelli laciniæ laterales virides, carinæ brunneæ. Cl. Rev. Parish observavit hanc ex pseudobulbis junioribus foliatis Julio, dein ex vetustis aphyllis Februario florere.

128. Cryptochilus meirax, Par. et Rchb. f., pseudobulbis depresso-turbinatis, fibrarum fasciculis simplicibus non reticulatis, floribus ante folia evolutis, bractea membranacea spathacea acuta perigonii basin superante, ovario calvo, sepalis alte connatis acutis, lateralibus basi in calcar spurium obtusum coalitis, petalis cuneato-ovatis acutis ciliolatis, lamina intus pilosa, labello obtusangulo triangulo undulato, angulis baseos obtusatis, callo bilobo in basi.

5. Malaxideæ.

130. Dendrobium atropurpureum, Miq. Fl. Ind. Bat. iii. 644.—*Oxystophyllum atropurpureum*, Bl. Rumphia, iv. 241; *Aporum concinnum*, Lindl. MSS. distr. Wallich.

131. Dendrobium (Aporum) terminale, Par. et Rchb. f., caule tenui ancipiti, foliis (ex icone Rev. Parish in vita) approximatis ensatis (siccis nervosis) abbreviatis, floribus subterminalibus, mento curvulo triangulo obtuso, sepalis triangulis, petalis linearibus acutis, labello cuneato flabellato bilobo, lobis obtusis, callo carinali nullo.

Aporum micranthum, b. ill. Griffith, facillime distinguendum carina unica a basi usque ante apicem bifidum excurrente, ibi abrupta (cfr. Calc. Journ. iv. t. xvi. f. 7).

133. Dendrobium (Aporum) multiflorum, Par. et Rchb. f., caule validiusculo anciti, foliis distantibus triangulis ensatis, floribus lateralibus seu terminalibus, nunc geminatis, mento bene angulato producto, sepalis ligulato-triangulis, petalis linearibus obtusis, labello ligulato flabellato emarginato lateribus lobulato, carinis obscuris elevatis geminis a basi usque ante apicem.—Flores flavi.

Plate XXXI. II. *Dendrobium multiflorum.* 5. Flower, front view. 6. Sepals and lip, expanded. 7. Column, anterior view.

136. Dendrobium (Eudendrobium) pachyglossum, Par. et Rchb. f., caulibus usque quinque pollices longis, tenuibus sulcatis vaginis junioribus nigro hispidis, foliis in superiore caule linearibus acuminatis, floribus lateralibus solitariis seu geminis parvulis, sepalis triangulis, lateralibus in calcar extinctoriiforme obtusum extensis, petalis linearibus acuminatis, labello cuneato oblongo-ligulato apice trilobo, lobis lateralibus obtusatis, lobo medio brevissime producto semiovato, carinis geminis per discum, columna apice bidentata.—Flores in icone cl. Rev. Parish musei Kewensis albidi. Sepala brunneo striata. Labellum albidum, basi brunneo-tristriatum, apice viride. Apud nos æstuario gaudet striis viridibus, et tale depinxit Rev. Parish in icone, quæ in herb. ill. di. Lindley, mutuata.—Simillimum est *Dendrobium attenuatum*, Lindl.! Typi tamen recedunt caule multo breviore, foliis longioribus, pluribus, longius persistentibus, labelli lacinia antica majore porrecta crenulata multipapulosa, laciniis lateralibus crenatis. Certe non idem.

137. Dendrobium bambusæfolium, Par. et Rchb. f., juxta *D. salaccense* et *luzonense*, Lindl., caule calami columbini crassitudine, vaginis arpophyllaceo-scrobiculatis, foliis distichis linearibus acuminatis, siccis papyraceis, usque 7″ longis, ½″ latis, florum fasciculis lateralibus 1–3-floris, sepalo summo triangulo, sepalis lateralibus triangulis in mentum retrorsum obtusangulum extensis, petalis cuneato-ovatis acutis, labello ligulato flabellato antice obscurissime trilobo retuso, medio utrinque obscurissime obtusangulo, apice bilobo.

Simillimum *Dendrobium hæmoglossum*, Thw. (Thw. Hook. f. Enum. Pl. Zeyl. 429!), bene recedit labello acuto, quod ipse vidi.

138. Dendrobium Findleyanum, Par. et Rchb. f., pseudobulborum articulis a basi tenui clavato-incrassatis, vaginis parvis, foliis cuneato-lanceolatis acutis apice bidentatis, pedunculis uni- bifloris, sepalis linearibus acutis revolutis, petalis a basi cuneata ovato-triangulis, labello cuneato oblongo obtuso integro hinc microscopice denticulato, toto disco velutino asperulo, lineis asperulis 5 ante callum basi abruptum, columna verisimiliter inornata.

Simile *D. crassinodi*, Bens. et Rchb. f., cujus nodi dilatati ac breviores, sepala et petala lilacina, labellum disco flavum, ceterum album lilacino marginatum striolis purpureis quibusdam in basi.

142. Dendrobium scabrilingue, Lindl. (*D. hedyosmum*, Batem. in Bot. Mag. t. 5515). Hæc planta ab ill. nostro Lindley in Borneo insula fuit indicata. Cum egregius collector Lobb ibi æque ac in Burmah collegerit, facile conjiciendum, eum lapsu quodam plantam inter Borneenses transtulisse.

166. Dendrobium pumilum, Lindl. in Journ. Linn. Soc. iv. 6, est ipsissimum *D. pumilum*, Roxb. Ic.! et Roxburghii descriptio diagnostica (Fl. Ind. iii. p. 479) usque ad "where it blossoms during the rains," est veræ plantæ. Omnia reliqua pertinent ad *Eriam flavam*, Lindl., quæ in eadem tabula Roxburghii repræsentatur. Griffithii descriptio brevis quidem, at certe primitus optima (Notul. iii. 315). Ill. beatus Lindley veram habuit plantam, sed florem, eheu! spurium, forte *D. pygmæi*.

Cæspitosum, parvum, pseudobulbis a basi tenui elongatis subtetragonis nitidis, usque 4″ longis, diphyllis, foliis oblongis obtuse acutis, floribus solitariis terminalibus, sepalo dorsali triangulo, sepalis lateralibus subæqualibus in angulum obtusum extensis, petalis linearibus acutis, labello ligulato flabellato bilobo.—Flores albi, labelli disco flavo.

Plate XXXI. I. *Dendrobium pumilum*. 1. Flower, side view. 2. Sepal. 3. Expanded lip. 4. Side view of column.

169. Dendrobium (Dendrocoryne) Chrysocrepis, Par. et Rchb. f., caulibus adultis a basi tenui dilatata compressis paucifoliis, foliis cuneato-oblongo-ligulatis acuminatis carnosulis, pedunculis ex pseudobulbis vetustis lateralibus unifloris, mento angulato, sepalis lateralibus ligulatis acutis, petalis latioribus obtuse apiculatis, labello ab ungue latiusculo elongato calceolari, apice retuso involuto paulisper fisso, utrinque lobulo superposito insiliente, extus velutino, intus pilis incurvis pluribus, columna brevissima antice villosa.—Juxta *D. euphlebium*, Rchb. f. in Journ. Linn. Soc. 1859, p. 7, valde diversum labello, ac caule vix dubie tetragono. Caules in *D. Chrysocrepide* juvenes subteretes, foliis 4 seu 5, vaginis ancipitibus, adultiores evadunt plani, ac laterales ramos edunt.

171. Bulbophyllum (Trias) pictum, Par. et Rchb. f., pseudobulbis turbinatis annulatis monophyllis, foliis cuneato-oblongo-lanceolatis acuminatis, pedunculis unifloris, sepalis abbreviatis lato-triangulis angulatis, petalis cuneato-ovatis apiculatis bene brevioribus, labello oblongo-ligulato acuto utrinque medio dente erecto obscuro obtuso parvo, columna antice in angulis omnino æquali, anthera proboscidea elongata angusta.—Albo-viridulum maculis pluribus purpureis, ex icone Rev. Parish.

175. Bulbophyllum (Monantha) capillipes, Par. et Rchb. f., rhizomate validiusculo annulato, pseudobulbis distantibus, pyriformi-fusiformibus tenuibus monophyllis, basi a fibris stipatis, foliis cuneato-ligulatis acutis, pedunculis tenuissimis valde abbreviatis, bracteis . . . . ., sepalo dorsali triangulo, sepalis lateralibus ovato-triangulis multo majoribus, omnibus septemnerviis, petalis oblongis apiculatis septemnerviis sepalo dorsali subæqualibus, labello in columnæ pede elongato oblongo obtuso acuto, utrinque medio angulato-dentato, cucullato, columna ebrachiata.

Ex icone Rev. Parish sepala et petala straminea venis rufis. Labellum purpureo-violaceum. Columna extus flava, antice brunnea. Pseudobulbi usque pollicares. Folia usque 6 pollices longa, dimidium pollicem lata. Flores mire ludunt illos *Polystachyæ Ottonianæ* seu *P. pubescentis*, Rchb. f., quibus æquimagni. Ortum pedunculi atque bracteam examinare non potui.

Plate XXXII. I. *Bulpophyllum capillipes*. 1. Sepals and petals expanded. 2. Lip, oblique side view. 3. Column.

176. Bulbophyllum (Monantha) moniliforme, Par. et Rchb. f., rhizomate tenui fibroso, pseudobulbis depresso-sphæricis monophyllis seriatis rhizomati adnatis, foliis . . . . . , pedunculo capillaceo tenui basi vaginata, bractea cupulari, floris elongati mento abbreviato, sepalis ligulatis acutis, dorsali trinervi, lateralibus quinquenerviis, petalis bene brevioribus ligulatis obtuse acutis, labello ligulato obtuse acuto, margine posteriore utrinque erecto, basi rotundata, columna biseta, setis erectis.—Flores minuti, vix $2\frac{1}{2}$ lin. longi, flavidi.

177. Bulbophyllum (Ptiloglossum) penicillium, Par. et Rchb. f., pseudobulbis pyriformibus haud valde distantibus, monophyllis, foliis petiolato-oblongo-lanceolatis acutis, pedunculo folium spithamæum longe excedente paucivaginato, apice longe racemoso, bracteis triangulo-setaceis ovaria pedicellata subæquantibus, sepalis triangulis, petalis oblongis obtusis brevibus ciliatis, labello a basi latiore acuminato papillis filiformibus multis plumoso, columnæ angulis aristato-porrectis.

179. Bulbophyllum (Lemniscoa) lemniscatum, Par., β. tumidum, Par. et Rchb. f., pedunculo porrecto curvato superne valde tumido, racemo deflexo, bracteis lato-triangulis xanthinis (nec lineari-setaceis acuminatis), ovariis valde hispidis, sepalis ovato-triangulis hispidis decidue lemniscatis, petalis lineari-lanceolatis uninerviis, labello cordato triangulo crasso obtuso brevi, columnæ aristis incurvis.

180. Bulbophyllum (Racemosa) alcicorne, Par. et Rchb. f., rhizomate repente valido, pseudobulbis minutis monophyllis, folio cuneato spathulato oblongo obtuse acuto, 4″ longo, supra 1″ lato, pedunculo gracili ima basi bivaginato, superne distanter bivaginato, racemo nutante multifloro, bracteis triangulis uninerviis minutis ovaria pedicellata subæquantibus, sepalis triangulo-ligulatis obtuse acutis ad apicem prope connatis, petalis ovato-triangulis subserratis uninerviis, labello unguiculato basi sagittato laciniis erectis, ligulato carnoso obtuso, columnæ brachiis tridentatis.—Flores ex minoribus, albidi, lineis atropurpureis. Labellum flavidum. Simile *Osyriceræ crassifoliæ*, Bl.

181. Bulbophyllum (Racemosa) xylophyllum, Par. et Rchb. f., juxta *B. khasyanum*, Griff., rhizomate repente valido, pseudobulbis distantibus subnullis (seu valde parvis), foliis petiolatis late oblongo-ellipticis carnosissimis, pedunculis tenuissimis, vaginis duabus acutis folium subæquantibus, floribus capitatis, bracteis triangulis ovaria pedicellata subæquantibus, floribus bene coriaceis, sepalo dorsali triangulo, sepalis inferioribus semiovatis obtuse acutis, petalis ligulatis acutis trinerviis brevioribus, labello carnoso ligulato obtuso flexo utrinque supra basin angulato, columnæ brachiis tridentatis, dente medio majore.—Flores viriduli, minuti.

183. Bulbophyllum (Racemosa) sicyobulbon, Par. et Rchb. f., rhizomate valido, pseudobulbis conicis monophyllis, folio cuneato oblongo-ligulato acuto, pedunculo validi usculo parte florida porrecta, vaginis in basi pluribus, sursum duabus laxis amplis, racemo plurifloro densifloro, bracteis linearibus acutis uninerviis flores subæquantibus, sepalo dorsali oblongo-triangulo breviusculo trinervi, sepalis lateralibus ligulatis acuminatis quinquenerviis longioribus, petalis triangulis hinc dentato-serratis aristatis uninerviis, labello carnoso basi utrinque falcula parva antrorsa ligulato, margine velutino, columna biseta, setis erectis. (Etiam Lobb in herb. Lindl.)

184. Bulbophyllum (Racemosa) cupreum, Lindl., subsp. stenopetalum, Par. et Rchb. f., pseudobulbis conico-turbinatis, monophyllis, foliis cuneato-ligulatis acutis, racemis longis cernuis, bracteis lineari-setaceis ovaria subæquantibus, sepalo dorsali triangulo abbreviato, sepalis lateralibus triangulis porrectis, petalis minutis triangulis integerrimis, labello porrecto ligulato acuminato basi rotundato utrinque unifalcato, columnæ setis aristæformibus erectis.—Flores flavido-aurantiaci.

185. Bulbophyllum (Racemosa) parviflorum, Par. et Rchb. f., rhizomate repente valido, pseudobulbis sphærico-depressis, monophyllis, foliis a petiolorum basibus ligulatis acutis, pedunculis gracilibus parce (5-) arcte vaginatis, superne longe racemosis, minutifloris, bracteis triangulis uninerviis ovaria pedicellata non æquantibus, mento angulato, sepalis triangulis trinerviis ciliatis, labello a basi cordata linguæformi obtuso medio piloso crasso, columna triseta, seta postica plumosa, setis anticis calvis acuminatis.—Flores albidi, minuti, illis *B. penduli* adhuc minores. Labellum viride. Affine *B. auricomo.*

186. Bulbophyllum (Racemosa) auricomum, Lindl. Re vera petala sunt ciliata in ipsissimis typis Lindleyanis. Prius ob has cilias a b. Lindley non descriptas nominatum fuit *B. fœnisecii,* Parish ! Ipsissimus tamen Rev. Parish plantam esse eandem felicissime auguravit.

188. Bulbophyllum (Racemosa) gracile, Par. et Rchb. f., pseudobulbis dense aggregatis depresso-sphæricis siccis gibbosis, pedunculo capillaceo basi vaginis paucis acutis distantibus, apice longe racemoso, bracteis triangulo-setaceis ovaria pedicellata subæquantibus, sepalis triangulis tri- quinquenerviis extus hispidulis, petalis linearibus uninerviis, labello cordato ligulato obtuso ancipiti, columna triseta, setis acutis paulo longioribus. Flores breves atropurpurei, bene secundi. Racemus valde tenuis.

189. Bulbophyllum (Racemosa) limbatum, Par. et Rchb. f., pseudobulbis rotundulis, vaginis in fibras solutis, foliis cuneato-oblongis apice minute bilobulis, cartilagineo-marginatis, superne obscure viridibus, inferne luride violaceis, racemo erecto basi paucivaginato, apice racemoso paucifloro, bracteis triangulis scariosis ovario pedicellato non æqualibus, mento valde obliquo, sepalo dorsali oblongo obtuso, sepalis lateralibus ligulatis obtuse acutis, medio obtusissime carinatis, petalis brevissimis lato-linearibus, apice triangulis erosis, labello trifido, laciniis lateralibus triangulis, superne denticulatis, lacinia medio lato ligulato carnoso papilloso ciliolata, carinula una in basi, carinulis duabus divergentibus, una utrinque in laciniam lateralem exeunte, columna trigona apice obtuse tridentata.—Sepalum dorsale rufum, punctis plurimis flavis transparentibus. Sepala lateralia linea mediana viridi, ceterum omnino brunnea, maculis pluribus flavidis.

Sepala viridula apice atropurpurea. Labellum atropurpureum. Columna flavida, antice et limbo atropurpurea. (Ad vivum ex horto Saundersiano.)

193. Bulbophyllum stenobulbon, Par. et Rchb. f., rhizomate longissime repente tenui, pseudobulbis teretiusculis apice attenuatis monophyllis distantibus, foliis cuneato-oblongo-ligulatis apice bilobo obtusatis paulo attenuatis ($2\frac{1}{2}''$ longis, $\frac{1}{3}''$ latis), pedunculis ex basi pseudobulborum et ex rhizomatis vaginis 3–5-vaginatis, vaginis angustis apice racemosis, floribus ad 3, bracteis triangulis ovaria pedicellata non æquantibus, sepalis triangulis ligulatis trinerviis, petalis oblongis obtusis trinerviis tertia brevioribus, labello a basi cordata ligulato-lineari obtuso, columna brevi apice biaristata.—Flores minuti, vix 2 lineas longi, flavi. Pseudobulbi duas pollicis tertias longi.

194. Bulbophyllum (Cirrhopetalum) lasiochilum, Par. et Rchb. f., pseudobulbis distantibus ovoideis costatis monophyllis, foliis cuneato-oblongis obtusatis, pedunculo unifloro, sepalo dorsali ligulato acuminato, sepalis lateralibus a basi cuneata ligulatis subliberis apice cohærentibus, petalis falcatis acuminatis ciliatis, labello ancipiti compresso utrinque angulato in ungue peltato pilis sericeis antrorsis multis vestito, columna apice sexdentata, dentibus geminis apice linearibus porrectis, reliquis minutis, angulo utrinque juxta foveam.—Olim ab ill. Griffith detectum, nunc iterum lectum.

195. Bulbophyllum (Cirrhopetalum) pumilio, Par. et Rchb. f., valde affine *B. retusiusculo*, Rchb. f., sed floribus nutantibus, sepalo dorsali apice attenuato, sepalis lateralibus rectis, nec tortis recedere visum, ne dicam de statura duas tertias imminuta.—Pseudobulbi distantes, conici, monophylli; folia cuneato-ligulata acuta. Pedunculus gracilis, hinc ultra duos pollices altus, capillaris, apice pauciflorus, umbellatus. Bracteæ triangulo-setaceæ ovariis pedicellatis plus duplo breviores. Sepalum dorsale triangulum, trinerve, nervis clavatis. Labellum a basi sagittatum, triangulum, anceps. Columna apice erecto bicornis. Sepala et petala albido-flavida nervis atropurpureis. Sepala lateralia flava. Labellum flavum, intus basi purpureum. Columna flava.

198. Bulbophyllum (Cirrhopetalum) bootanense, Par. et Rchb., f., rhizomate longe repente, pseudobulbis distantibus conicis monophyllis, foliis cuneato-oblongis obtuse acutis, pedunculis bifloris (ex Griff. trifloris), bracteis oblongis acutis convolutis ovaria pedicellata dimidia non æquantibus, sepalo summo ovato acutiusculo brevi, sepalis lateralibus oblongo-ligulatis convolutis, mento basilari obtusangulo, petalis semilanceolatis acuminatis, labello semisigmoideo carnoso flexo ancipiti, columnæ auriculis erectis aristatis.—Flores ex icone Rev. Parish viriduli brunneo-purpureo maculati. *Cirrhopetalum bootanensis*, Griff. Notul. iii. 286; Griff. Ic. Plant. As. pl. ccxcix.

Plate XXXII. II. *Bulbophyllum bootanense*. 4. Side view of flower. 5. Dorsal view of flower. 6. Side view of column and lip. 7. Sepal. 8. Side view of column. 9. Pollinia, back side view.

199. Bulbophyllum (Cirrhopetalum) Griffithianum, Par. et Rchb. f., pseudobulbis distantibus, conico-tetragonis monophyllis, foliis cuneato-oblongis acutis, pedunculis arcte bivaginatis, floribus bene umbellatis, sepalo dorsali triangulo setaceo ciliato, sepalis lateralibus cuneato-oblongo-ligulatis acutis trinerviis, petalis triangulis acuminatis ciliatis, labello ancipiti sigmoideo utroque latere incrassato, columnæ auriculis obtusatis.

A Rev. Parish cum *Cirrhopetalo gamosepalo*, Griff. Notul. 206, comparatur, quod labello acuminato sepalisque lateralibus punctatis recedere videtur.—Flores ex icone Rev. Parish albidi, brunneo striati. Columna purpureo maculata.

200. Bulbophyllum (Cirrhopetalum) tripudians, Par. et Rchb. f., pseudobulbis depresso-conicis, foliis . . ., pedunculo vaginis arctis ternis distantibus, apice prono, racemo breviusculo disticho, bracteis latis scariosis brevissimis ovatis apiculatis deciduis, sepalo dorsali perbrevi oblongo acuminato ciliato lacero fornicato, sepalis lateralibus ligulatis acutis in arcum connatis, petalis triangulis margine ciliato-fimbriatis acuminatis, labello carnoso pandurato brevi utrinque incrassato, pilorum fasciculis tecto, columnæ setis utrinque productis.—Ex icone Rev. Parish sepala ochracea. Labellum violaceum. Petala ochracea striis geminis violaceis. Columna albida, bracteis violaceis. Simillimum *Cirrhopetalum Wallichii*, Lindl. !, jam bracteis acuminatis elongatis, facillime distinguitur, quæ persistunt.

201. Bulbophyllum (Cirrhopetalum) merguense, Par. et Rchb. f., rhizomate repente, pseudobulbis oblongis costatis nitidis monophyllis, foliis cuneato-oblongo-ligulatis obtuse acutis, pedunculo bivaginato apice bractea lanceolata brevi unifloro, sepalo dorsali triangulo acuminato ciliato apice clavis deciduis fimbriato, sepalis lateralibus linearibus acutis tortis valde longioribus, petalis triangulis ciliatis apice clavis deciduis onustis, labello cordato-triangulo obtuso carnoso, columna apice utrinque obtusangula.—Color floris albido-flavus. Sepala et petala purpureo striata. Labellum purpureum. Columna flavida. Hæc ad iconem Rev. Parish.

Obs. Professor Oliver kindly informs me that a living specimen, sent by M. Berkeley, jun., shows strictly five-angled pseudobulbs.

204. Malaxis (Oberonia) Myosurus, Par. et Rchb. f., cæspitosa, paucifolia, acaulis, foliis prope cylindraceis minutis papulis obtectis, pedunculo basi paucivaginato, superne cylindraceo racemoso, bracteis lanceis, margine microscopice denticulatis, sepalis triangulis obtusis, petalis linearibus, labello oblongo, apice longe bifido laciniis filiformibus, utrinque quinquedentato, quasi bipectinato, dentibus superioribus ternis obtusis, inferioribus acuminatis.—*Oberonia Myosurus*, Lindl. Gen. et Sp. Orch. 16, descriptio et planta Wallichii, excl. syn. Forst.; planta Wallichii in herbario Lindleyano, n. 1947 e, Nepalia, 1821; planta Wallichii in herbario Hookeriano, n. 1947, lecta ad Taka Nepaliæ, Martio 1821.—Folia usque 5 pollices longa. Hucusque omnino obscura.

211. Liparis Jovis-pluvii, Par. et Rchb. f., affinis *Liparidi paradoxæ*, Rchb. f., foliis membranaceis 2–4 nunc limbo albo viridique tessellatis, cuneato-oblongis acuminatis bene nervosis, pedunculo longe exserto apice racemoso, racemo plurifloro, bracteis lineari-lanceolatis deflexis, floribus minutis, sepalis linearibus, petalis filiformibus, labello columnæ per unguem adnato dein cordato oblongo acuto, columna apice utrinque quadrato-auriculata.

212. Liparis stenoglossa, Par. et Rchb. f., spithamæa, foliis membranaceis quaternis a vagina longiuscula ovatis bene acutis, summo quidem folio multo angustiore, racemo laxifloro, bracteis triangulis quam ovaria pedicellata infima subbrevioribus, quam reliqua

bene brevioribus, sepalis lineari-ligulatis lateralibus obliquis, petalis anguste linearibus, labello ligulato apice retuso bilobo, columna gracili apice utrinque rotundato alata.

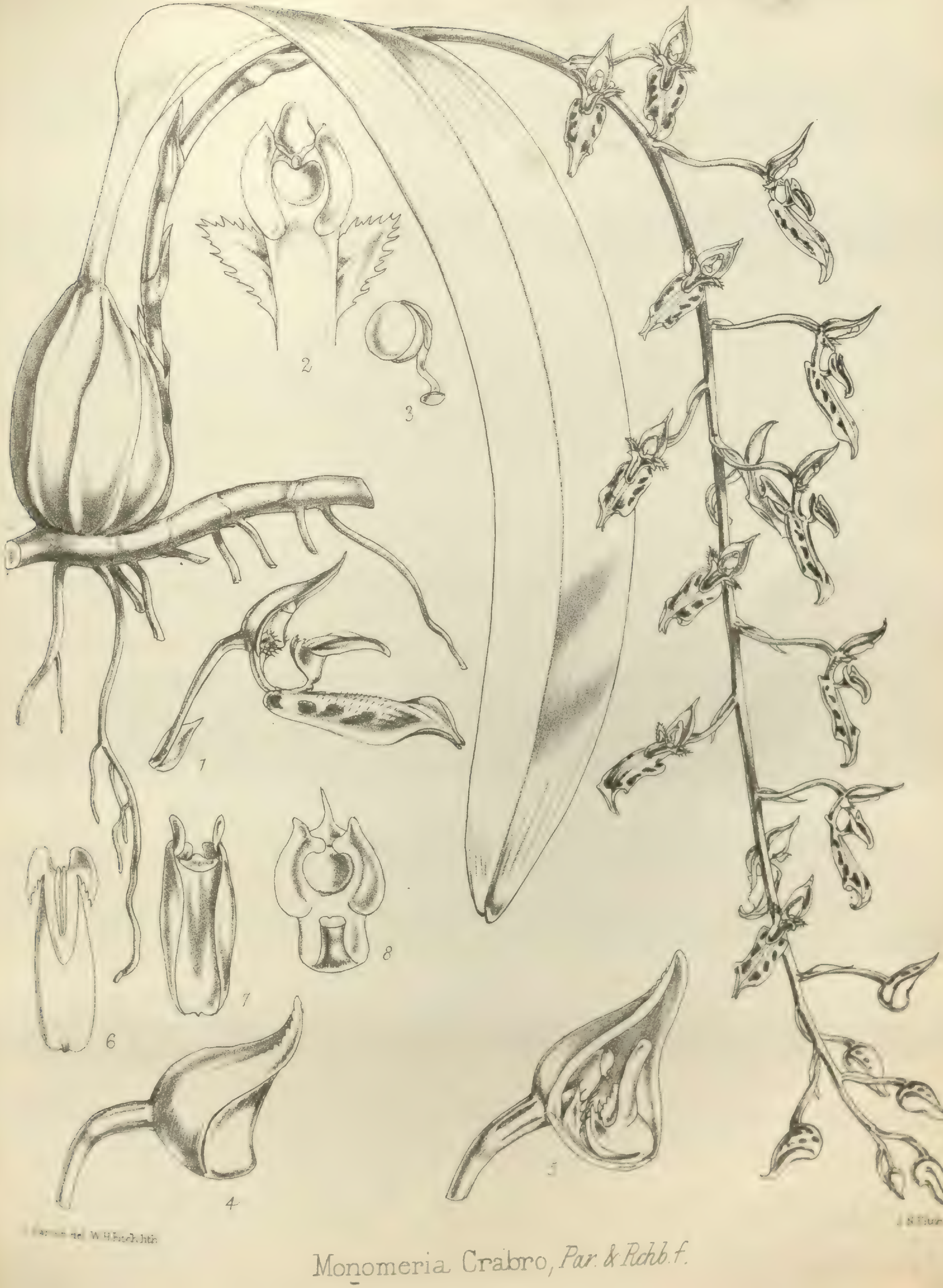
213. Liparis bistriata, Par. et Rchb. f., humilis, pseudobulbis cylindraceis (?), caule florido amplo vaginato diphyllo, foliis pergameneis cuneato-oblongo-ligulatis apiculatis, racemo plurifloro, rhachi superne alata, bracteis anguste triangulis uninerviis ovaria pedicellata æquantibus, sepalis lineari-ligulatis, petalis lineari-filiformibus, labello lineari-pandurato apice retuso denticulato, columna apice ampliata.—Flores virides. Lineæ in labelli basi duæ brunneæ a cl. Parish observatæ.

214. Liparis Pachypus, Par. et Rchb. f., humilis, pseudobulbis crassis brevibus pyriformibus monophyllis, folio pergameneo cuneato ligulato acuminato, pedunculo alato racemoso, bracteis lineari-acuminatis ovaria subæquantibus, sepalis linearibus trinerviis, petalis lineari-filiformibus, labello cuneato flabellato emarginato-bilobo crenulato ima basi obscure bicalloso, columna basi et apice ampliata.—Flores viriduli.

C Parish del. W.H Fitch lith.

J.N Fitch imp

A.1.3. Habenaria pelorioides. *Par. & Rchb. f.*
B.4.9. H. vidua *Par. & Rchb. f.*



Monomeria Crabro, *Par. & Rchb. f.*

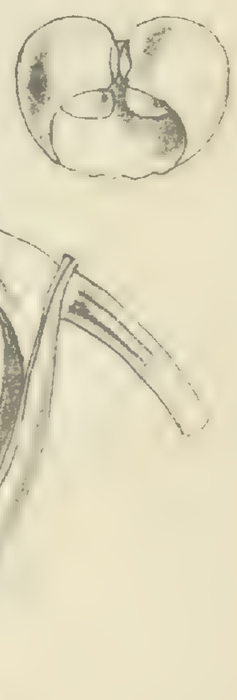
Parish del. W.H. Fitch. lith. J.N. Fitch. imp.

Thecostele alata, *Par. & Rchb. f.*

F. Parish del.ᵗ Fitch lith.

J. N. Fitch imp.

A. 1. 5. Luisia primulina, *Par & Rchb f.*
B. 6. 8. Coelogyne ochracea, *Lindl. subs. conferta. Par & Rchb f.*
C. 9. 17. Eria Pleurothallis, *Par & Rchb f.*



Marsh del. W.H.Fitch lith

J. N. Fitch imp

A. 1. 3. Dendrobium pumilum. *Roxb.*
B. 4. 6. D. multiflorum *Par. & Rchb. f.*

Parish del.t Fitch lith

J.N.Fitch, imp.

A.1.3. Bulbophyllum capillipes. *Par.& Rchb f.*
B.4.9. B. bootanense. *Par.& Rchb f.*

THE

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V. *On the* Lecythidaceæ.

By John Miers, *F.R.S., V.P.L.S., Dignit. and Commend. Ord. Imp. Bras. Rosæ, &c.*

(Plates XXXIII.–LXIV.)

Read June 5th, 1873.

The great family of the *Myrtaceæ* was divided by De Candolle (in 1828) into 5 tribes[1]:—1. *Chamælauceæ*, with a unilocular ovary and fruit; 2. *Leptospermeæ*, with a dry multilocular fruit; both tribes confined to Australia; 3. *Myrteæ*, with a softish drupaceous fruit, more or less plurilocular, cosmopolitan in their origin,—all these tribes being distinguished by opposite leaves, marked by pellucid dots; 4. *Barringtonieæ*, with a drupaceous fruit and alternate impunctate leaves, all natives of the vast regions of Asia, Africa, the Malayan and Polynesian islands; 5. *Lecythideæ*, with leaves always alternate and impunctate, a hard fruit opening by an operculum, with many solid nuciform seeds, or several imbricated winged seeds; its flowers have numerous stamens seated upon an expanded process quite peculiar to the group; they are wholly confined to the New World. Subsequently (in 1842) he united the two latter groups into his 4th tribe, *Barringtonieæ*[2].

Lindley (in 1830)[3] regarded the foregoing characters as of sufficient value to warrant the separation of the *Barringtoniaceæ* and *Lecythidaceæ* as distinct natural orders—a view originally suggested by Richard and Poiteau[4].

More recently Bentham and Hooker[5] combined the 4th and 5th tribes of De Candolle with their 4th tribe *Barringtonieæ*, which they divided into 3 subtribes, 1. *Barringtonieæ*, 2. *Lecythideæ*, 3. *Napoleoneæ*.

I prefer the arrangement of Lindley for many strong reasons. The leading characters which mark the *Lecythidaceæ* as a family distinct from *Myrtaceæ* are not only their alternate impunctate leaves, but the epigynous (not perigynous) insertion of the stamens; they have also the large conspicuous petaloid development exclusively belonging to this group, and upon which the stamens are seated; they have likewise fruits and seeds remarkably different from those of *Myrtaceæ*.

De Candolle first showed, in his analytical drawings of his first three tribes of *Myrtaceæ*[6], that their numerous stamens, with long slender filaments, are all seated upon a perigynous disk agglutinated to the tubular portion of the calyx, the petals being fixed at the same time upon the outer margin of this disk, often regarded as a part of the calyx; and this portion, so united with the disk, forming the most conspicuous character of the *Myrtaceæ*, is called the *hypanthium* by Berg: it is persistent upon the fruits of that group, the disk being marked by cicatrices where the fallen filaments were articulated upon it.

[1] Prodr. iii. 207. [2] Mém. Myrt. p. 54. [3] Nat. Syst. p. 46; Veg. Kingd. pp. 739 & 754.
[4] Mém. Mus. xiii. 141. [5] Gen. Plant. i. 605.
[6] Mém. Myrt. pls. 1–8 for the *Chamælaucieæ* and *Leptospermeæ*, pls. 9–21 for the *Myrteæ*.

For the present, the consideration of true *Barringtonieæ* will be deferred until the *Lecythidaceæ* have been fully examined, premising that *Gustavia* must certainly be transferred to the latter group.

In the *Lecythidaceæ* there is no hypanthium in the sense above indicated; but the very numerous stamens, always very small and short, are borne upon as many appendages, crowded upon a basal ring adnate upon a narrow flat annular epigynous disk; and this ring is always expanded into a peculiar development, called by Berg an *urceolus*, but which, by right, should bear the more appropriate name of an *androphorum*, long before given to it by Mirbel [1]. This process is signally manifested in *Gustavia*, offering an undeniable reason for excluding it from the *Barringtonieæ*, where it has been erroneously placed.

In *Gustavia* (Plate XXXIII. A) the inflorescence, in its general features, resembles that of most *Lecythidaceæ*; its large yellow flowers, upon pedicels, having in their middle 2 short bractlets, possess a calyx adnate to the ovary, with a raised border, which is either short and nearly entire, or is longer and divided into 6 acute sepals; it has 6 or 8 very large petals, unequal in size, imbricated in æstivation, severally inserted by their claws between the disk and the base of the androphorum, where they are all agglutinated together, so that, after fertilization of the ovary, the petals and androphorum, still united, fall off together. The androphorum differs from that of most others in this family in being equally expanded all round: it is very large, in the shape of an orbicular broad shallow cup, and seemingly composed of several superposed plates agglutinated together, successively smaller in diameter, all alike deeply cleft on their broad free margins, into numerous subulated segments, standing in many imbricated whorls which curve inwards toward the style, the inner series very short, the rest gradually lengthening outwards, until those of the outer series are nearly as long as the semidiameter of the cup. These segments have generally been mistaken for the filaments of the stamens; but in reality they are not so, being subulated divisions of each plate, truncated or clavated at their extremity, where the true filament is inserted, this being terete, very slender, and usually shorter than the linear 2-celled anther, which at first opens by 2 apical pores. This feature is well depicted by Berg [2]. The inferior ovary is divided into 6 cells, with many ovules in each, severally suspended by distinct funicles from the placentary expansion of the central axis; it is crowned by the sepals and annular disk, as before mentioned, the vertex or space within the latter being flattish, with a short conical style in the centre. The epigynous disk subsequently acquires a peculiar development in the fruit—a conspicuous feature throughout the whole family. The fruit is a globular pyxidium about the size of an apple, flattened on its summit, where it is encircled by a band (the enlarged disk) enclosed within two parallel zones, the lower one formed by the vestiges of the decayed sepals; the upper one denotes the inner margin of the enlarged disk, and forms the line of its opercular dehiscence: the pericarp is coriaceous, normally 6-celled, with

[1] Mirbel, Elém. i. 240. The more modern name *andrœcium*, as opposed to *gynœcium*, is better applicable to the whole system of male organs, comprehended by Mirbel under the title of *androphorum*, while this latter name may be limited, as is here done, to that peculiar system of male organs found only in *Lecythidaceæ*.

[2] In Mart. Flor. Bras. fasc. 18, tab. 55. fig. 14.

a thick fleshy column in the axis attached to the operculum, when, on the ripening of the fruit, the dissepiments and placentæ become resolved into a pulp, which envelops the seeds, all escaping together with the decay of the operculum. There are usually 6 seeds in each cell, nearly the size and shape of a common bean, suspended within the pulp by a fleshy tortuous funicle of nearly its own size; the testa is polished, crustaceous, with a large annular micropyle; a thin inner integument invests an exalbuminous embryo, consisting of two large oval plano-convex cotyledons, conjoined near the hilum by a small terete radicle, and embracing within their margin a conspicuous plumule.

In *Couroupita* (Plate XXXIII. B), as in the following genera, we find a floral structure analogous in its peculiarities to that of *Gustavia*, but offering a different appearance, owing to a modification in the form of its singular androphorum. The flowers are large, supported upon a short pedicel, with 1 bract above and 2 below it, all very deciduous; the free portion of its adnate calyx rises above the ovary in the form of 6 smallish fleshy very convex sepals, somewhat imbricated in æstivation; it has 6, rarely 7, very large concave coloured petals, of unequal size, deeply imbricated in æstivation, their claws being inserted between the epigynous disk and the staminiferous ring of the androphorum, all these fixed together as in *Gustavia*. The androphorum is large, with a shallow cup-shaped annular ring at its base, covered by numerous short appendages, each bearing a stamen; but this ring does not expand equally all round as in *Gustavia*; on the contrary, its enlargement takes place on one side only, under the form of a ligular fleshy plate, twice the length and as broad as the basal staminiferous ring, bare between its parallel margins, coiling gradually inwards, and considerably at its extremity, where it forms an inverted globular hood, concealing the ovary and basal ring; the interior of this hood is densely echinated by numerous subterete appendages, truncated at their summit, where each bears a stamen, consisting of a short thread-like filament, supporting a small anther of 2 collateral oval cells, bursting outwardly and longitudinally. The staminiferous appendages of the basal ring differ from the others only in being much shorter. By analogy we may infer that this androphorum, as in *Gustavia*, is composed of many superposed plates agglutinated together, gradually shorter in length, fringed by the incision of their marginal extremities into numerous segments or appendages, assuming an imbricated and echinated appearance. We may see that this structure is not hypothetical but real, by a section made across the fleshy plate of the ligula, when it is seen marked by many particoloured lines indicating a stratified structure analogous to the inner bark of *Lecythis*, which beaten when dry resolves itself into many membranaceous sheets. The vertex of the ovary of *Couroupita*, within the area of the epigynous disk, is much elevated in a pulvinate form, and is deeply hollow in the middle, where a short thick conical style is seen, surmounted by a 6-rayed sessile sulcated stigma; the inferior portion of the ovary is 6-celled, with several ovules in each cell, in a double series, suspended by separate funicles from the bilamellar placentæ, which extend from the upper part of the axis into the cavities of the cells. This placentation is considered by Dr. Crüger[1] to be normally parietal, as in *Cucurbitaceæ*, the radiating parietal lamellary placentæ (dissepiments) having their ovuligerous margins

[1] On the development of the flower of *Couroupita*, in Linnæa, xxi. p. 774.

introflected into the cavity of the cells, leaving the axis hollow: this circumstance, he adds, alone suffices to make an ordinal distinction between *Myrtaceæ* and *Lecythidaceæ*. The structure of the ovary in *Couroupita* is correctly described, though wrongly interpreted by him. It appears to me to differ little from the ordinary axile placentation, the only divergence arising from the hollow style, a hollow continued to the point where the placentæ branch off near the summit into the cavities of the cells, leaving the axile column solid below that point for the greater portion of its length. Dr. Berg figures the ovary in *Couroupita surinamensis* as being superior[1]; this appears to me a mistake, as in all the species I have seen it is certainly inferior. The fruit has been well described by Poiteau and others; it is a heavy globular pyxidium, like a cannon-ball, showing two zonary lines, one near the summit, denoting the small operculum, the lower one marking the vestiges of the sepals; the operculum does not fall off, as is usual in the *Lecythidaceæ*, but is drawn inwards by the contraction of the central column attached to it. The pericarp, $\frac{1}{2}$–$\frac{3}{4}$ in. thick, consists of 3 layers—a thinnish hard ligneous epicarp, an inner thin osseous endocarp, and a thicker intermediate subfleshy mesocarp. There is some descrepancy in the details of different authors regarding the structure; but all agree that the operculum does not fall off. Aublet states[2] that the epicarp is ligneous and 2 lines thick—that the endocarp is thin, hard, and brittle—that the mesocarp between them is thicker, succulent, and fibrous, which at maturity becomes deliquescent. He adds that in order to preserve the fruit it is necessary to bore two holes on opposite sides, to allow the fluid mesocarp to escape, when the endocarp becomes detached and free. Poiteau corroborates the same facts[3], adding that the osseous endocarp is 1 line thick, the epicarp rather thin, though firm and crustaceous, and that, after the escape of the deliquescent mesocarp, the detached endocarp rolls about freely within. Aublet gives a figure of the endocarpic lining thus detached, which is quite spherical, rounded and smooth at the summit, without any indication of the continuity of the axile column with the stigma, or of the endocarp with the summit—a circumstance which admits of great doubt: it is more probable that, owing to the extreme tenuity of the brittle endocarp at its summit, it easily breaks off there when violently shaken, and thus becomes detached as described. Dr. Berg figures a section of the fruit of another species from Surinam, and corroborates the facts stated by Aublet and Poiteau; but, from the incompleteness of the drawing, no light is thrown upon the doubt I have stated. The endocarp is 6–7-celled, divided by dissepiments, which with the placentæ, as in *Gustavia*, are resolved into a copious pulp; this, exposed to the air as it escapes through the opercular opening, becomes purple or dark red, emitting a nauseous odour; from 30 to 40 seeds are enveloped in the pulp, each suspended, as in *Gustavia*, by a thick funicle of half its length. These are broadly ovate, less than half an inch in diameter, the outer tunic being somewhat coriaceous, and with the funicle clothed by velvety articulated hairs; this testa splits along one side round the large micropyle, thus allowing the nucleus to escape; the embryo, covered by a thin integument, is exalbuminous, globular, consisting of a terete radicle and 2 fleshy foliaceous cotyledons,

[1] In Mart. Flor. Bras. *l. c.* tab. 58, last figure on third line.

[2] Aublet, Pl. Guian. ii. pp. 708, 711, tab. 282.

[3] Mém. Mus. xiii. p. 152, tab. 7 (6).

which first descend and then ascend in a hippocrepiform manner, being corrugately plicated as in *Couratari* and *Cariniana*.

Bertholetia (Plate XXXIII. c) has an inflorescence in axillary or terminal racemes, shorter than the large leaves, its flowers being nearly sessile, with 3 deciduous bracts at their base; they are easily recognized by their calyx, the free, cup-shaped portion of which is divided into 2 large fleshy concave sepals, notched at their apex by 3 small teeth; they have 6 oblong coloured petals, slightly reflected at the apex, and patently expanded, unequal in size, some of them often cleft, appearing like 9 petals; these are fixed by their claws, agglutinated between the androphorum and disk, as in the preceding genera. The androphorum resembles that of *Couroupita*, but differs in the echinated appendages of the hood, which are obtusely subulate, and void of stamens; the inner surface of the cup-shaped ring, however, is densely furnished with short club-shaped appendages, each bearing a fertile stamen with a short slender filament and a small oval 2-celled anther, and is well figured by Poiteau[1] and by Berg[2]; the inferior ovary is turbinated, 4-grooved, 4- rarely 5-celled, with about 5 sessile ovules in each cell, radiating from the axis; its vertex is slightly concave, with a long, terete, incurved style in the centre, surmounted by a minute, globular, papillose stigma. Its pyxidium greatly resembles that of *Couroupita* in size and shape, marked by two zonal lines, the lower one, some distance below the summit, caused by the vestiges of the fallen sepals, the upper one forming an opercular opening only half an inch in diameter; when dry it is covered by a thick brittle bark-like epicarp, which in one species peels off irregularly, leaving a ligneous or subosseous shell: within are seen the remains of 4 coriaceous dissepiments; the columella is too thick to allow of its escape at the summit, and, shrinking by drying, sometimes draws the operculum attached to it into the cavity of the fruit: for the same reason the seeds cannot effect their escape, and remain in the shell until it rots upon the ground: the 4 cells contain about 20 to 30 dry seeds, closely compacted round the columella, to which they are attached by a hilum near their base. Berg asserts[3] that the seeds are enveloped by a yellow fleshy pulp, which, by desiccation, leaves each enclosed in a distinct sort of cell: the fruits I examined afforded no trace whatever of any such pulp; and Bonpland, Poiteau, and Schomberg, who examined them in the living state, and give abundant details concerning them, are all silent as to the existence of pulpy matter: we have, however, direct evidence on this point, in a specimen belonging to the Linnean Society, where a cluster of 5 seeds, evidently the contents of one cell, are agglomerated very closely together upon a portion of the columella, without the slightest trace of any pulp or of any funicle: we have here, therefore, a strong proof of the inaccuracy of Berg's statement regarding the fact. The seeds, well known as the *Brazil nuts* of the shops, are easily distinguished from *Sapucaia-nuts* by their acutely trigonoid form, well figured by Poiret, Bonpland, and Berg; the outer covering, or testa, is thick and coriaceous, with broad longitudinal channels at the angles, filled with numbers of spiral

[1] Mém. Mus. xiii. 149, tab. 4. fig. 6.

[2] Fl. Bras. *l. c.* tab. 60, on the fourth line of figures, the last of which shows the sterile appendages of the hood.

[3] In Mart. Fl. Bras. *l. c.* p. 479.

vessels belonging to the branching raphe; a solid nucleus fills the testa, covered by a very thin integument; it has no albumen, is homogeneous in substance—in fact is a gigantic radicle, as in *Lecythis*, with extremely minute cotyledons, situated at the extremity contrary to the hilum: these are generally overlooked; but at that point two converging grooves may be seen, caused by the overlapping of the edges of the minute cotyledons, so smoothed by pressure as to be scarcely visible except under maceration; they are better seen in a longitudinal section of the nucleus, when beneath them a roundish plumula is distinctly perceptible, from which a line extends all round, parallel with the periphery, which marks the line of union between the external lamina of the exorhiza and the internal neorhiza, which forms the main body of this gigantic radicle. This view of the structure is confirmed by a specimen in the Kew Museum, where, in a germinating seed, the plumula expanding into the nascent stem is seen forcing its way between the minute cotyledons, while at the opposite extremity the mammillary point of the neorhiza protrudes downwards to form the root. The account given by Berg is, that although the nucleus seems "pseudo-cotyledonous," it is in reality dicotyledonous, adding in a parenthesis the words of Martius[1]:—"Cotyledones tamen 2 adsunt plerumque inæquales, commissura arctissima sibi per transversum seminis applicitæ; rostellum (radicula) fere in medio semine laterale, parum conspicuum." In accordance with this account, longitudinal sections are given to express his meaning[2], where 2 large superposed cotyledons, horizontally in contact, show in a chink on one side a small imbedded radicle at the point of their union. Any one who cuts through a Brazil nut will see that Berg's description is wholly incorrect; and it is deeply to be regretted that so palpable a mistake on this important point of structure should mar the value of the copious analyses in a work of such beautiful execution as the 'Flora Brasiliensis.' I may add, also, that my view of the structure of the embryo is essentially the same as that given by Richard[3].

The genus *Lecythis* (Plate XXXIV. A) is numerous in species; but more than one half of those referred to it by authors belong to other genera, as I propose to demonstrate; the details of its floral and carpological structure here given apply therefore to this genus as now restricted for the first time. These species form some of the most ornamental trees of the forests, being generally from 20 to 60 feet high, with a copious foliage, a solid timber of considerable use, with a soft inner bark of some thickness, easily detached, and which, beaten while fresh, resolves itself into numerous distinct membranous sheets. Poiteau relates[4] that he counted as many as 110 of these laminæ in a single flake of the bark; it is called estopa (oakum) in commerce, and is applied to many useful purposes. The leaves of the true *Lecythis*, compared with those of the excluded species, are generally smaller, of much thinner texture, of a brighter colour, and finely serrated on the margin; but in some few species they are entire, with small specks on the margin, indicating the abortive teeth. The inflorescence is racemose or panicular, axillary or terminal: the flowers, often of large size, sometimes mediocre in dimensions,

[1] Mart. Flor. Bras. *l. c.* p. 479.
[2] *Loc. cit.* tab. 60, in the lower line of figures.
[3] Observations on Fruits and Seeds (edit. Lindley), pp. 62 & 72.
[4] Mém. Mus. xiii. p. 147.

are supported upon short bracteolated pedicels; the tubular calyx, adnate to an inferior ovary, is crowned by a border of 6 free, rather small sepals, slightly imbricated in æstivation; they have six, seldom fewer, large petals, somewhat unequal in size, broadly imbricated in æstivation; the androphorum is large and conspicuous, attached to the claws of the petals and to the disk by its basal annular ring, which is densely covered with short staminiferous appendages; it is expanded on one side into an incurving bare ligula, terminating in an inverted hood, similar to that of *Bertholletia*, and, in like manner, densely echinated with innumerable imbricated appendages, which are terete, bearing in all the lower series, on their clavated summits, each a fertile stamen; but the upper ones longer, incurved, are mostly bare of stamens; the stamens consist of a short slender filament, supporting a small anther, formed of 2 oval collateral cells, without connective, which burst along the margin by a longitudinal suture, when they expand into 2 parallel plates. The ovary, always more or less inferior, is crowned by the persistent disk, and an inner vertex, generally flat, bearing in the centre a slender terete style, sometimes as long as the sepals, rarely reduced to an umbonate form; it is terminated by a minute, globose, papillose stigma; the ovary is 4-celled, with several ovules in each cell, in 3 or 4 series, all radiating from a fleshy placenta in the axis, each borne upon a distinct funicle. By these characters alone any species of true *Lecythis* can be distinguished from all others. The fruit is a pyxidium, generally of great size, very thick, densely ligneous, extremely variable in form, and always marked by 2 concentric lines, as in the preceding genera; the lower or calycary zone owes its origin to the tumescent bases of the sepals, while the upper zone, or opercular line of dehiscence, indicates the junction of the disk with the vertex, as seen in the ovary; the operculum proceeds from the growth of the vertex alone, while the interzonary band simply arises from the enlargement of the disk. The fruit, from its weight, naturally hangs in an inverted position; and when ripe a swelling is at first noticed around the opercular zone; and afterwards, by the rupture of the central column, the operculum falls off with a portion of the column attached to it: the numerous seeds, sustained by their funicles, now hang down in a bunch and soon fall to the ground, the main body of the shell remaining long suspended from the lofty tree; at this period the fleshy mass of the funicles ferments, and exhales a very nauseous odour. The suspension of the seeds, each by a fleshy funicle nearly as large as itself, is a circumstance hitherto unrecorded in any botanical work: the confused statement of Von Martius, given in a note by Berg[1], does not describe any such funicle; on the contrary, it says "funiculum non prodit;" its existence, however, cannot be doubted, and is a circumstance of especial importance, as it offers a broad line of distinction between *Lecythis* and *Eschweilera*, genera hitherto confounded together. The seeds of a species abundant in the province of Para are exported to Europe in considerable quantities, and sold here in the shops as *Sapucaia-nuts*: they have a hard, almost osseous covering, are oblong, somewhat angular, furrowed by 6 to 10 costate ridges, all branching from the hilar scar; and these ridges contain bundles of spiral threads, which belong to its branching raphe; at first their thick cover-

[1] Mart. Flor. Bras. *l. c.* p. 481.

ing is somewhat soft, but in drying becomes so hard that it is difficult to break it without injuring the nucleus, which tightly fills it; this nucleus, covered by a very thin integument, often marked by a small chalaza at its lower extremity, is an amygdaloid, exalbuminous embryo, of an oblong form, obtuse at both extremities, consisting, as in *Bertholetia*, almost entirely of a gigantic radicle, showing an obsolete mammillary point at the upper or hilar extremity, and presenting at the lower end 4 minute decussately imbricated teeth, which are cotyledons, so smoothed by great pressure as to escape notice; they are more distinctly seen in a longitudinal section, where a rounded nipple (plumula) is seen beneath the cotyledons; and continuous with it we perceive the conferruminated line of junction between the exorhiza and neorhiza of the radicle, running parallel with the periphery of the nucleus. The germination of this seed takes place as I have described it in *Bertholetia*; the plumular extremity swells, and protrudes itself between the cotyledons, which it forces aside, and extends so as to form the ascending stem of a new plant, furnished with scale-like leaflets, while the opposite end of the neorhiza, bursts through the thin pellicle of the exorhiza, to form the descending root. Lindley states that the *Lecythidaceæ* are distinguished from *Rhizophoraceæ* by the seeds having no power to germinate in the seed-vessel[1]; but I have figured in Plate XXXIV. A a seed of *Lecythis* in a germinating state, which I found within a fruit, and which completely confirms the structure above indicated. It is essential here to correct another error of Martius, supported by Dr. Berg, where it is affirmed that the seeds of *Lecythis* are partly covered by a soft, fleshy, lobed or lacinulated *arillus*[2]; but I feel assured, by actual observation in its live state, that no such arillus exists there, as my specimens, preserved in alcohol, evidently show. The appearance to which Martius here refers is more probably accounted for by the small quantity of pulpy matter due to the disintegration and softening of the dissepiments, which occur only at a late period, in the extremely ripe state of the fruit.

Chytroma (Plate XXXIV. B) is a new genus[3], founded on several species necessarily separated from *Lecythis*. The plants composing it resemble that genus in general habit and inflorescence; the flowers have similar sepals and petals; the basal ring of the androphorum is rather broad, with an elevated margin, and is covered inside with very crowded, short staminiferous appendages, while the ligular portion terminates in an inverted hemispherical hood, densely echinated within by imbricated appendages, as in *Lecythis*; but these are mostly sterile. The ovary is very different, as it wants the long style of that genus; it is half superior; and its vertex, instead of being concave, rises considerably in a semioval or cupola-shape, surmounted by a very short, conical, obtuse style; although 4-celled, it has no central column or prominent placentæ, which are not needed, because its few ovules, without funicles, are attached at the base of the cells, and erect: these are important distinctions. The pyxidium is much smaller than in *Lecythis*, and of thinner consistence; it has the two zones universal in the family; the operculum, without a columella attached to it, is concave inside, with a cruciform ridge

[1] Veget. King. p. 739.

[2] Mart. Fl. Bras. *l. c.* p. 481 in adnot.

[3] So called from χύτρος, *olla*, ὁμός, *similis*, from the shape of its fruit.

(part of the dissepiments), and is furnished inside, within the margin, with a velarium (a name given to the portion descending within the mouth of the shell, seen in *Eschweilera* and *Jugastrum*); the coriaceous pericarp is 4-celled, cruciately divided by persistent membranaceous dissepiments, which meet in the centre, without any thickening in the axis: when the fruit ripens, the operculum does not fall off immediately, but remains for some time, until the membranaceous dissepiments become lacerated by decay. As the ovules were erect within the ovary, so we find the seeds, which fill the cells of the fruit, attached to the bottom by a large basal hilum; these are large, 1 to 3 in each cell, have no funicle, are of an oblong-oval shape, erect, and, according to Dr. Spruce, in his species *turbinata*, "are enveloped in an exceedingly aromatic *arillus*, which the ants speedily devoured"[1]. This, I presume, was mucilaginous; for I found no trace of it in the dried state. Their testa is thinly coriaceous or testaceous, showing on the ventral side a broadish ribbon-like band, extending from the base to the apex, free on both edges, and only connected with the testa by a nerve-like line; this band contains a cord of spiral vessels, and is the main branch of the raphe; the testa is also marked by several broad, prominent, cancellated ramifications, also furnished with spiral vessels, and leaving the intervening depressed areoles slightly granulated, while the branches are paler, smooth, and polished: the contained nucleus, enveloped in a membranous integument, is an exalbuminous embryo, tough in texture, of a dark greenish colour, of an extremely bitter taste, homogeneous throughout, and very different in appearance from the white, sweet, amygdaloid kernel of the Sapucaia-nut; from the concentric line, visible in a longitudinal or in a transverse section, it seems formed of a thick exorhiza, encircling a much smaller neorhiza, without the signs of any cotyledon. Aublet's *Lecythis amara* may be considered the type of the genus, which he has figured in flower and in fruit[2].

The genus *Eschweilera* (Plate XXXIV. c), originally suggested by Von Martius, but afterwards confounded with *Lecythis* by Berg, is here at length established upon a satisfactory basis. De Candolle, upon the brief and insufficient notes of Martius, first published it in 1828[3], hinting at the same time that it might prove to be only a section of *Lecythis*; but in 1837, in order to correct this misunderstanding, Martius gave a fuller outline of his genus[4]. Endlicher, in 1841, again complicated the matter, by absorbing *Eschweilera* into *Lecythis*, on the imperfect ground suggested by De Candolle[5]; he was then evidently unacquainted with the diagnosis of Martius published four years previously. All subsequent botanists followed Endlicher: even Berg, author of the beautiful monograph of the *Lecythidaceæ*, published under the ægis of Martius, with the aid of his valuable materials, so far mystified the subject that he had to modify the characters of *Lecythis* in order to bring *Eschweilera* within its limits, quoting the memoranda of Martius only as foot-notes. It is clear that Berg had no precise knowledge of the structure of either genus. *Eschweilera* comprises numerous species, all trees, some of great magnitude, others only low trees, all with the habit and inflorescence of *Lecythis*. The flower has 6 small sepals, 6 much larger petals, and the usual androphorum, the hood being

[1] Hook. Kew Journ. v. p. 170.
[2] Pl. Guian. ii. 716, tab. 286 & 285 A.
[3] Prodr. iii. 293.
[4] Bot. Zeit. (1837) xx. part 2, p. 89.
[5] Gen. Plant. p. 1235.

echinated inside by pointed linear appendages, which are generally bare of stamens. The ovary, as in *Chytroma*, is semiinferior, its vertex being raised, conical, longitudinally striated, and gradually narrowed into an obtuse style; it differs, however, from that genus in being constantly bilocular; it has few ovules, which are always uniserial, erect, and sessile in the base of the cells. The pyxidium, as in *Chytroma*, is comparatively small, and of a subglobular or depressed turbinate form; the coriaceous pericarp is at first 2-celled; but its membranaceous dissepiment, without the trace of an axile column, soon becomes evanescent; and it then appears unilocular, like a hollow cup. Berg figures a species [1] (which I have not seen) where the dissepiment is as thick as the pericarp, and is persistent. The upper or opercular zone is nearly equal in diameter to the lower or calycary zone: the convex operculum, which soon falls off, is hollow and conchoid within, with scarcely a trace of the dissepiment, and, as in *Chytroma*, is furnished near its margin with a pendent velarium, which descends within the mouth of the pericarp, from which at maturity it becomes detached; the latter contains 4, sometimes 6 seeds, which fill its cavity; these are ovoid, erect, and sessile, attached to the bottom of the cup by a broad hilum; they shrink much in drying, and differ in appearance greatly from those of *Chytroma*, having a very dark testa, tolerably thick and coriaceous, ecostate, scrobicularly rugulose all over, marked by irregular grooved lines, which, ascending from the hilum, indicate the main branches of an embedded raphe, which is again subdivided into innumerable threads, distributed through the entire fabric: within the testa are two distinct submembranaceous integuments, the outer one the size of and slightly clinging to the testa, the inner one adhering to the other on the ventral face, but free from it on the dorsal side, where it is much shorter and narrower, owing to its insinuation between the folds of the very corrugated surface of the embryo on that side: between these two integuments we perceive, in the dried state, a quantity of black pulverulent matter in clots, appearing as if deposited from a gelatinous fluid that had existed between the two integuments: this structure was constant in all the seeds I have examined: the embryo, much contracted by drying, is of a dark green colour, smooth on the ventral face, with a sharp scutiform margin, pulvinated and deeply corrugated on the dorsal side; this embryo, when cut across in different directions, appears homogeneous in substance, as in *Chytroma*, with a thick external exorhiza, and an internal neorhiza subtruncated at its summit, obtuse towards the base [2]. Here, then, we find a large amount of differential characters; the absence of a long terete style, a semisuperior and 2-celled ovary, with only 2 or 3 ovules in each cell, which are erect (not suspended by funicles), a much smaller and thinner pyxidium, always 2-celled, without any columella, a thin conchoid oper-

[1] Mart. Flor. Bras. *l. c.* p. 494, tab. 73. fig. 1.

[2] I regret that while in Brazil I omitted to examine critically the seeds of *Eschweilera* in their fresh state. Without success I have since repeatedly solicited my friends in Rio de Janeiro to send me the fruits preserved in spirits. I have examined numerous seeds in the dry state, with the results above detailed; and, in addition, I may here remark that I have invariably observed in the furrows of their surface, in some species a white, in others a reddish pulverulent efflorescence, indicating perhaps the existence of a fugitive thin cellular deposit, analogous to the arilloid envelope seen by Dr. Spruce in the seeds of *Chytroma*. I recommend this circumstance to the attention of future observers.

culum provided with a velarium, no pulp, few erect sessile seeds (not costate, nor suspended by large fleshy funicles), different seminal integuments, an embryo of another shape and structure, not white and edible, but extremely bitter, offer characters so diametrically opposed to *Lecythis*, that it is difficult to fancy how *Eschweilera* could ever have been confounded with it.

Jugastrum (Plate XXXV. A) is a genus proposed for a group of plants[1] of which few species are yet known; they form trees, sometimes 100 feet high, with trunks 3 to 6 feet in diameter, while others do not exceed 10 or 20 feet in height; and they have the general habit and inflorescence of *Lecythis*: the flower has 6 thick, unequal sepals, 6 obovate, subequal petals, and an androphorum with a somewhat broad basal ring, densely covered with short staminiferous appendages extending halfway up the ligula, the remainder of which is bare; the hood is very convex, saddle-shaped, inverted, lacinulated along its margin, and densely echinated within by shortish, strap-shaped, ascending appendages, most of which, especially at the upper extremity, bear stamens, like those of the basal ring; the ovary is more than semisuperior, its vertex being high, dome-shaped, and terminated by a short conical style; it is 2-celled, with very numerous ovules in several series, sessile in the bottom of the cells. The pyxidium resembles in size that of some species of *Eschweilera*; but it has a much thinner pericarp; it is subglobose or turbinate, with two parallel zonal cinctures, the persistent sepals, unchanged in form, often remaining on the lower zone; the upper or opercular zone is generally of equal diameter, leaving the interzonal band often very narrow and erect; the operculum, obtusely umbonated, is thin in substance, hollow and conchoid inside, showing within its margin a descending velarium, as in *Chytroma* and *Eschweilera*; though normally 2-celled, it becomes unilocular by the evanescence of its membranous dissepiment, the vestiges of which can only be seen on the wall of the pericarp and operculum; consequently there is no central column: the pericarp is coriaceous, thinner than a shilling, and contains from 10 to 20 seeds, closely packed, filling the entire space when fresh; but they shrink considerably in drying, in which state only have I been able to examine them; they are subcylindrical, acutely 4-angular at the sides, tapering towards the basal hilum, convex at the summit by pressure against the operculum, erect, affixed in 3 series to the bottom of the cell, where the cicatrices at their hilar points of attachment constantly remain: in some species the seeds are fewer, much broader, much compressed, and convex on the dorsal face; the testa, acutely angular, is coriaceous, about the thickness of a thin card, is smooth, opaque, and brownish outside, coarsely granulated inside by pressure against the nucleus; and in its substance is found a dense network of white spiral vessels: in drying, the nucleus contracts considerably within the testa, but preserves the same shape, is of a saffron-colour, deeply corrugated all over: the inner integument is finely membranaceous, adhering to the testa, and presenting a similar surface; the nucleus, when cut through, appears homogeneous in texture, of a pale brown colour, spotted all over with minute dark oil-cells: if a section be made longitudinally through the ventral angle, we see a continuous line near the periphery, indi-

[1] So named from *ζύγαστρον*, *arcella*, in reference to the shape of the pyxidium.

cating the junction of the exorhiza and neorhiza, the latter truncated at its summit, and obtusely pointed towards the base; and in the middle of the ventral side we see it enlarged by a nipple-shaped protuberance, which touches the margin opposite to a small external knob in the exorhiza, having a longitudinal slit; the protuberance is the plumule; the knob consists of 2 minute cotyledons, a structure offering much analogy to that in *Bertholletia* and *Lecythis*; in germination this plumule is extended into the ascending stem of the new plant, while the base of the neorhiza forces its way through the exorhiza, to form the root. I have not witnessed this germination; but Martius describes it, and Berg portrays it in several analytical figures under the head of *Lecythis coriacea*[1]. On comparing the details of the structure of the nucleus given above (the exactness of which I can affirm with confidence) with the analytical figures and description of Berg, several discrepancies will be seen. Berg confirms the position I have assigned to the plumule, and the existence of an external knob, with a slit in it, through which it forces its way in germination to form the ascending stem; but there is evidently a mistake in the position he assigns to the sprouting rootlet, which he places in the middle of the dorsal face: this assuredly would spring from the bottom of the neorhiza, the existence of which was wholly unknown to him. Berg made his analytical drawings entirely from the old notes of Martius, and under the belief that the nucleus was a single gigantic cotyledon, instead of a monstrous radicle, as it appears to me and under which point of view the phases of its germination are best explained. Berg affirms that the inner integument, as in the testa, contains many spiral vessels; but I have not been able to detect them there.

Although the genus *Couratari* (Plate XXXV. B) is one of the oldest and best-known of the family, its floral structure has not yet been correctly described; the only figures hitherto published are those of Richard, under a reduced size[2], and of Cambassèdes[3], all of which are incorrect. Aublet never met with the flower; nor did Poiret, who derived all his details from Richard. Berg, in his monograph of the family, has created much confusion by his thorough misunderstanding of the subject; even when he saw a flower of a true *Couratari*, he failed to recognize it, but described and figured it, as well as its fruit, under the name of *Lecythopsis*[4], while his generic character and his several analytical drawings, given under the name of *Couratari*[5], actually belong to *Cariniana*. Its species, which are not many, all form noble trees, with the foliage and general inflorescence of *Lecythis* and *Couroupita*: the flowers are rather large, upon short pedicels, furnished with 3 deciduous bracts; they have 6 fleshy, ovate, expanded, subequal sepals; 6 very large oblong unguiculated petals, of which the two exterior are largest; a large androphorum, formed of an oblong, subpatelliform basal ring, attached to the claws of the petals, and furnished inside with a triple series of crowded, short, clavate appendages, staminiferous at the apex, the stamens formed as in *Lecythis*; the ligula, as broad as the

[1] Mart. Flor. Bras. *l. c.* p. 491, tab. 72, where the two upper rows of figures show the pyxidium with its enclosed seeds, the two lower rows of figures delineating the badly drawn shape of the seeds and the mode of their germination.

[2] Ann. Sc. Nat. 1e Sér. i. p. 329, tab. 21.

[3] Flor. Bras. Mér. ii. 379, tab. 159.

[4] Mart. Flor. Bras. *l. c.* p. 503, tab. 75, 76.

[5] Ibidem, p. 506, tab. 78–82.

basal ring, is long and bare, suddenly coiling twice inwards into a fleshy knob, and again quickly recurved in the form of a large inverted semiglobose head, densely echinated with pointed, flat, imbricating appendages on the upper side (not on the inside, as in *Lecythis*), and concealing the involuted fleshy knob; these external appendages are quite destitute of stamens. The turbinate ovary is inferior, 3-celled, with several ovules fixed in the base; the vertex is hollow, with a raised crenated ring within the disk, and is furnished in its centre with a very broad, elevated, umboniform style, surmounted by an articulated, polished, globose stigma, hollow in the middle. The fruit and seed were first figured by Aublet[1], afterwards well drawn by Poiteau[2] and Richard[3], lastly by Berg, as before stated, under the name of *Lecythopsis*[4]. The pyxidium is trigonoidly cylindrical, often obconical in form, with two zonal lines near the summit, and a narrow interzonal band, the lower line formed by the vestiges of the sepals, the upper one denoting the line of dehiscence round the depressed umbonated operculum; this latter is agglutinated to the thick triangular central column, whose cuneiform angles form as many thickened dissepiments, at first attached to the inner wall of the pericarp, thus leaving three equal intervening spaces, or flat cells: when the fruit ripens, this columella shrinks, and the edges of the dissepiments become detached from the wall of the pericarp, the operculum and columella fall out, carrying with it the many large-winged seeds, imbricately attached to it, to be soon scattered by the wind: the cylindrical pericarp, now rendered vacant and unilocular, is coriaceous, somewhat thin in substance, with a cracking bark, which covers a reticulated latticework of woody fibres. The seeds, about 6 in each cell, are large in area, extremely thin, oblong in form, with a compressed scutiform cellule in the centre, one third of its length, and surrounded equally all round by a broad submembranaceous wing, all collaterally imbricated and attached by their base to the lower portion of the columella; the scutiform centre contains an exalbuminous embryo, which fills its space, and is covered by a membranaceous inner integument; the embryo consists of a long terete radicle, pointing downwards towards the hilum, and curving abruptly at its summit, is there united to 2 longer descending cotyledons, which are broad, foliaceous, deeply plicated and corrugated, thus, in an inverted form, resembling the embryo of *Couroupita*.

The genus *Cariniana* (Plate XXXV. c) of Casaretto has been acknowledged by few botanists; but its floral and carpical characters have been well illustrated by Berg, under the name of *Couratari*, for which he singularly mistook them. *Cariniana*, however, is a valid genus, containing several species, all trees of noble proportions, mostly from 100 to 120 feet in height, with gigantic trunks, often spreading out in large buttresses. The species, some of which are known only from their fruits, extend from Central Brazil to the Amazonas region, one being known from Trinidad. The leaves vary much in size in the several species, in some 1 inch long, in others more than a foot in length; but the inflorescence, more constant in character, is peculiar, always in wide-spreading, very

[1] Pl. Guian. tab. 290.
[2] Mém. Mus. xiii. tab. 8.
[3] Ann. Sc. Nat. *l. c.* tab. 21.
[4] Flor. Bras. *l. c.* tab. 75, 76.

slender panicles, charged with numerous flowers, which are minute compared with those of all other *Lecythidaceæ*. They have 6 small rounded sepals, united in a short flat cup, which extends a little beyond the adnate portion of the calyx: petals 6, longer, linear-oblong, equal, slightly imbricated along their margins, somewhat adhesive at their summits; and though they sometimes expand rotately of their own accord, they often adhere, enclosing the androphorum, and fall off united with it, like a bonnet. The androphorum differs in its shape from all others; it is erect, urceolate, or tubular for half its length, and without any ligula, expands upwards on one side more than on the other, curving over the summit in the form of an alcove, and is deeply laciniated all round the margin into subulate incurving appendages; inside its tubular portion it is everywhere echinated with similar, shorter, staminigerous appendages, either fixed in few concentric series, or more densely crowded, all clavate, each bearing on its obtuse summit a short filament, supporting a 2-celled anther. The inferior ovary is 3-celled, with several erect ovules in the base of each cell; its vertex rises pulvinately or conically, bearing a short style and a small 3-toothed stigma. The pyxidium has the trigonoidly cylindrical or obconical form of that of *Couratari*; but it is much thicker, heavier, and more solid in substance: it has the usual two zonary lines near its summit; but the opercular zone is placed upon or is somewhat within the vertex; the operculum is often slightly convex, sometimes does not rise above the upper zone, being quite flat, in both cases thick and cylindrical for some distance within the tubular mouth of the pericarp, and is continuous with the central columella, of equal diameter, which descends to the base, thus forming a solid, cylindrical plug, chamfered off on three sides, the intervening angles touching the wall of the pericarp, and leaving three compressed spaces or seminiferous cells; when ripe, the columella shrinks a little, and falls out, so that the pericarp remains with a clean cylindrical bore throughout its length. The seeds, though winged, are very different from those of *Couratari*; the wing is much narrower, and placed at one end only of the much shorter embryoniferous escutcheon, equal to it in breadth: the seeds are attached to the columella by the bottom of the wings in pairs, rising imbricatively to the top of the cells, where we see deep impressions left by the convex surfaces of the several escutcheons, caused by pressure while the parts were soft; the apical escutcheon is oblong-oval, oblique at its base, convex outside, flat on the back, is thinly coriaceous, and contains an exalbuminous embryo, consisting of a slender terete radicle of its whole length, pointing downwards towards the hilum, suddenly incurved at its summit, and there united to 2 descending cotyledons shorter than it, closely and corrugately plicated together, as in *Couratari* and *Couroupita*.

Allantoma[1] (Plate XXXVI. A) is a new and very curious genus. It consists of several species, some (probably all) vast trees, with the habit and inflorescence of *Couratari*, and leaves with similar venation: but the flowers are not so large; they have 6 sepals, roundish and expanded, slightly imbricated at their base in æstivation; they have 6 longer membranaceous petals, 4 of which are linearly oblong, and 2 very large and round, more exterior, and very imbricated, so as to conceal the others in æstivation; the androphorum is quite peculiar, is of a deep rose or reddish colour, very fleshy, and

[1] So named from ἀλλᾶς, *botulus*, ὁμὸς, *similis*, the fruit resembling a sausage in form.

exuding a purple-staining juice when slightly pressed; it has at its base a shallow cup-shaped ring attached to the disk, charged inside with short densely crowded staminiferous appendages, and laterally expanded into a smooth incurving ligula, which suddenly coils round into a fleshy knob, as in *Couratari*; it then widens into a semiglobose inverted hood, which is again retroflected upward, and obsoletely fringed on its margin; this is not echinated as in *Couratari*, but the appendages are all consolidated into a soft fleshy mass which envelops and conceals the knob; each club-shaped appendage of the basal ring bears a short filament and a 2-celled anther; the ovary is quite inferior, semiglobose or turbinate, mostly 4-celled, or 3-celled in one species, 5-celled in another, with about 6 collateral ovules in each cell, all erect, and fixed on the bottom of the central axis; the vertex is slightly concave, with a thick short fungiform style in the middle, and an umbonate stigma as in *Couroupita*. The pyxidium is not nearly so thick and solid as in *Cariniana*; in texture and shape it more resembles that of *Couratari*, being quite cylindrical, round at the base, truncated at its summit, where it is marked by the usual two zones, with a narrow band between them; it opens on the opercular zone, which has the same diameter as the pericarp; the operculum above is depressed, slightly pulvinated, concave and umbonated in the centre, and beneath is intimately conjoined with the columella, which at first is 3–5-angular, the angles united to the wall of the pericarp so as to form the cells, as in *Couratari* and *Cariniana*; at maturity the columella shrinks very much, becomes tapering and free from the pericarp, when, still attached to the operculum, it falls to the ground, leaving the seeds to drop also. The seeds are few, arranged imbricatively, and fixed to the columella by a basal hilum; they are linearly oblong, thickish, somewhat flattened on the anterior and posterior faces, acute and much jagged on the straight margins, have a dark or reddish colour, are rough behind, corrugate-tuberculous in front, unequally 2-lobed at the base, the hilum being on the posterior side of one of these lobes; and thus they bear the form and appearance of the seeds of *Tyloderma*, a genus of the *Hippocrateaceæ*, formerly described [1]; the testa, as thick as a sixpence, is filled everywhere with bundles of spiral vessels, is smooth inside, and lined with a semiadherent blackish membranaceous inner integument, which covers the exalbuminous embryo; this latter is of a long fusiform shape, slightly compressed and tapering towards each extremity, is of an opaque white colour; and when boiled in water or soaked in that fluid for a few days, it becomes as soft as a custard, but is again consolidated by drying. It appears to me a homogeneous macropodous radicle, consisting of an external exorhiza easily softened, and a harder terete internal neorhiza of its entire length, obtusely pointed at each extremity; and it probably germinates as in *Lecythis*, one end protruding in its growth to form the ascending stem, the other to extend into a root.

Grias (Plate XXXVI. c) was established, in 1753, by Linnæus [2], upon a Jamaica plant, first mentioned by Sloane [3] under the name of Anchovy-pear, and by P. Brown as a species of *Calophyllum* [4]. Jussieu in 1789 [5], favouring the idea of Brown, placed it among the *Guttiferæ*. Swartz first gave a good diagnosis of its generic characters in 1791 [6].

[1] Linn. Trans. vol. xxviii. p. 413, tab. 29. [2] Sp. Plant. 732; Gen. Plant. (edit. Schreb.) 732.
[3] Jam. ii. 123, tab. 217. figs. 1 & 2. [4] Ibid. p. 245. [5] Gen. p. 257. [6] Obs. p. 215.

Sir J. Smith [1], in 1819, described the genus upon the materials of preceding authors. De Candolle, in 1828, placed *Grias* among the abnormal genera of *Myrtaceæ* [2]; but Endlicher, in 1841 [3], removed it to the dubious genera of *Lecythidaceæ*; Lindley, on the other hand, arranged it among the uncertain genera of *Barringtoniaceæ* [4]. Seemann, in 1852 [5], considered *Grias* a genus of the latter family, placing it between *Careya* and *Gustavia*. Fnally, it has been located by Bentham and Hooker [6] in their tribe *Lecythideæ*, intermediate to *Gustavia* and *Couratari*. It consists of 4 known species, all from tropical America, being very lofty trees with extremely large leaves, sometimes 3 feet long, and an inflorescence generally springing from the trunk or bare branches, in fascicles of 6 or 8 flowers, each on a distinct pedicel, bracteated at its base, all crowded upon a gemmiform peduncle. The flower is of mediocre size, with an inferior ovary, crowned in the bud by an entire globular calyx, which afterwards splits into 2 or 4 subequal concave submembranaceous segments, persistent in the fruit: it has 4 alternate oblong fleshy petals, with parallel sides, imbricated in æstivation, then rotately expanded, inserted by their claws between the androphorum and disk; the androphorum is half the length of the petals, resembling somewhat in form (though greatly reduced in its proportions) that of *Gustavia*; it is regularly urceolate, deeply cleft round its margin into numerous segmental appendages, and is charged inside with 3 or 4 concentric series of similar gradually shorter appendages, like those in *Couroupita*, the inner row very short, all at first erect, and suddenly incurved at the apex, a little below which, dorsally affixed upon each, is the short slender filament of a stamen, bearing 2 distinct oval anther-lobes, collaterally attached at a point above their middle, and opening laterally by longitudinal fissures: the vertex of the ovary is concave within the inner crenulated margin of the disk, and is broadly umbonated in the centre, where it bears a sessile 4-rayed stigma, in which respect it resembles *Couroupita*: the inferior ovary is semiglobose, 4-celled, with 2 to 4 ovules in each cell, suspended from the summit. The fruit in the Jamaica species is the size of a small pear, of a russet colour, smooth and 8-grooved; by abortion of 3 of its cells, it produces only a single seed, of an oblong form, grooved and pointed at both ends, being an edible amygdaloid embryo, probably homogeneous, as in *Bertholletia*, and germinating in the same manner. Lunan relates that these seeds, after their fall in moist places, propagate in this manner so thickly that they become interlaced in thick clusters [7]. The trees always grow by river-sides, or in very moist places. The *Pirigara tetrapetala* [8] of Aublet belongs to this genus; its flowers correspond in every respect with those of the other three species; but its fruit is globular, 4-celled, void of pulp, and contains a few irregular-shaped seeds, suspended from the summit by thick funicles.

The genus *Cercophora* [9] (Plate XXXVI. B) completes the eccentric varieties of forms observed in this family. It is founded upon a single flower that had fallen upon a panicle of *Chytroma Spruceana*, in which it was entangled: this was one of Spruce's plants, No. 3695, from the Rio Negro; so that we do not yet know the kind of leaves it

[1] Rees's Cyclop. vol. 17. [2] Prodr. iii. 296. [3] Gen. No. 6335. [4] Veg. Kingd. 755.
[5] Bot. Her. p. 126. [6] Gen. Pl. i. 722. [7] Hort. Jam. i. p. 20. [8] Pl. Guian. i. 487, tab. 192.
[9] A name derived from κέρκος, *cauda*, φέρω, *fero*, from the caudate expansion of the androphorum.

has or the character of its inflorence; it probably belongs to one of 15 species[1] which he was there obliged to pass by, as they were far too high and quite out of his reach. The flower expanded is $1\frac{1}{2}$ in. in diameter, has 6 subequal oval fleshy sepals, dorsally rugulose, with membranaceous denticulate margins; 6 petals, six times as long as the sepals, somewhat unequal in size, oblong, membranaceous, fixed by their distinct claws between the disk and the base of the androphorum; the latter is comparatively small, with a broad deep cup-shaped ring at the base, covered inside by 5 series of crowded short appendages, somewhat 4-grooved and truncated at their summits, each bearing there a short slender filament that supports a 2-celled anther; similar staminiferous appendages are extended over a short and rather broad incurving ligula (an expansion of the basal ring), which widens into a concave hood inverted over the centre; this hood is corrugated outside, and is formed into a hollow purse-shaped cavity, truncated at its mouth, and on the middle of its outer edge it is expanded into a tongue-shaped strap, which is again incurved beneath the sacciform hood: there are no appendages upon any part of the hood, though they abound on the ligula; the inside of the sack is marked by many parallel prominent nerves or coloured ridges, which do not quite reach the margin of the mouth, but terminate in as many spots: the ovary is inferior, 3-celled, with many small ovules in each cell, fixed to a nearly basal placenta in the axis; the vertex is somewhat concave within the disk, radiately striated, having in the centre a curving terete style, longer than the sepals, as in *Lecythis*, and terminated by a small whitish stigma of 3 short erect lobes.

This review shows that notwithstanding the great diversity of structure in the *Lecythidaceæ*, there is always a sufficient degree of uniformity in its general characters to maintain them as a distinct natural order in the fullest sense of that term. They consist of trees of immense growth, rarely of smaller size, with leaves always alternate, generally quite or obsoletely serrated, without pellucid dots; the flowers, often of great size, are in axillary or terminal racemes or panicles; the adnate calyx has generally 6 free sepals: the petals, equal to them in number, are large, oblong, very imbricated, with their claws insinuated beneath the androphorum, and agglutinated with it upon the annular epigynous disk: all have a remarkable androphorum, mostly of great size, which is petaloid under the modifications previously described: the very numerous and very small stamens have short slender filaments, with 2 minute anther-cells, never fixed immediately upon the disk, but always borne upon much longer distinct appendages, originating upon the basal ring of the androphorum or upon its expanded head; these appendages are clavate in the former position, are much longer, subulately linear, imbricatively echinate, and very frequently barren in the latter: the ovary, generally quite inferior, more rarely semisuperior, has 2 to 6 cells, with ovules (not very numerous) either suspended by funicles from the axis, or erect and sessile at the base of the cells; the style is not much longer than the sepals, terete, slightly incurved, or short and broadly conical, with a minute stigma. The fruit is always a woody pyxidium, with opercular dehiscence under different modifications, and is quite peculiar: the seeds are

[1] Kew Journ. iv. p. 283.

generally large, each often suspended by a fleshy funicle nearly as large as itself, often imbedded in pulp, at other times dry, erect and sessile in the base of the fruit, winged or bare, often costate, all with an exalbuminous embryo, sometimes of singular development. We have here a sum of remarkable characters, in reference to which we find no parallel whatever in the *Myrtaceæ*.

On the other hand we see in the *Myrtaceæ*, properly restricted, opposite leaves, with punctate glands, often concealed within a thick parenchyma, but generally apparent, pellucid, and of aromatic flavour : the flowers, generally small, 4- or 5- rarely 6-merous, have an inferior ovary, with 4, 5, 6, or more cells, with many horizontal or ascending ovules; a circular annular disk agglutinated to the free tubular portion of the calyx, and therefore unmistakably perigynous, which bears the petals upon its outer margin, and is charged all over with numerous stamens in several series, except when, rarely, they are uniserial; the filaments are very long and slender, coiled and replicated in æstivation: the disposition of the calyx, charged with its staminiferous disk, is so peculiar that it has received the name of an hypanthium: the fruit, in the first tribes, is generally capsular, but drupaceous or baccate in the *Myrteæ* : all are plurilocular, or by abortion rendered 1-celled, with bare fleshy erect exalbuminous seeds[1]. Compared with these trenchant features, no correlative characters are to be found in *Lecythidaceæ*.

Under such circumstances it appears to me injudicious to agglomerate into a single natural order groups so utterly distinct as the *Myrtaceæ*, *Lecythidaceæ*, *Barringtoniaceæ* and *Napoleoneæ* : a family so congregated can hardly be said to possess a single positive peculiarity, because under the fusion of so many opposing characters, each of the ordinal features necessarily becomes negative, and, according to my view, tends to destroy the uniformity and utility of any system of arrangement based on such a principle.

On a future occasion I will proceed to detail the structure of the *Barringtoniaceæ*, and will endeavour to show by evidence the affinity they bear to the above and to other families. I propose also to demonstrate that the *Napoleoneæ* have no relationship with the above order or with *Myrtaceæ*, and that the 2 genera composing it have no mutual affinity, and belong to other different orders. I am also prepared to deal with the many dubious genera referred to the group of the Lecythidaceæ: *Couponi*, Aublet, forms a singular genus (*Cupirana*) of the *Apocynaceæ* ; *Cupheanthus*, Seem., certainly belongs to the *Lythraceæ* ; *Fœtidia*, Lam., appears to me to belong to the same family; *Calostemma*, Benth., seems referable to the *Pomeæ* in *Rosaceæ* ; *Tropiera* offers a near affinity with *Glossopetalum* in *Celastraceæ*. And I have also to describe and figure a new genus *Harmena*, founded on a plant from New Caledonia, noticed by Dr. Seemann in his Fl. Vit. as a specimen of *Barringtonia speciosa* ; this forms an interesting genus of

[1] Dr. Berg makes a distinct tribe of his genus *Feijoa* (*Orthostemon*) because of its albuminous seeds (Mart. Fl. Br. *l. c.* pp. 467 & 615). The two species on which it is established do not appear to differ much from others growing in the same locality, referred to his genus *Myrcieugenia*. He seems to have had some misgiving on the subject, because he neither describes the albumen in the copious details of the text above cited, nor has he figured it in plate 54, where the ripe fruit is shown. So loose a statement cannot be received as evidence of a fact of such importance, which would form a unique exception to the universal structure of the whole family. It will be remembered that a very analogous error was made in the same work in the case of *Maytenus* (see Linn. Trans. vol. xxvii. p. 326).

Rhizophoraceæ, which tends to confirm my notion that the *Barringtonieæ* gravitate towards that family rather than to the *Myrtaceæ*.

The *Lecythidaceæ*, as above analyzed, are here divided into 12 different genera; and I now proceed to give a distinct diagnosis of each and a description of their several species. Every specimen to which access was attainable has been carefully examined; and in describing the species to which they belong, one uniform system has been adopted in the arrangement of their characters. In those species described by previous authors, and which I have had no opportunity of examining, the characters so given are redistributed under the same order of sequence as that adopted in my own enumeration, so that their mutual differences may be more easily compared. It is necessary to premise that few herbarium specimens can be identified with the large fruits preserved in museums. I have never attempted in any case to associate them without good authority; consequently the fruits not duly provable appear here as separate species, thus increasing their number to more than circumstances would otherwise warrant; but it is better to suffer this disadvantage than to give a false character to any species. The specific features afforded by the fruits are excellent, and quite equal in value to those furnished by the plants and flowers. No difficulty whatever has been found, in the absence of the fruit, to determine with tolerable accuracy, from the structure of the ovary in the bud, the genus to which any specimen belongs—a result which can hardly be said to have been attainable before. This is a great point gained in our knowledge of the family. The characters, especially those of the ovary, are therefore carefully noted in the several species, as they serve to justify the position to which the different specimens are assigned.

1. Gustavia (Plate XXXIII. a).

This beautiful genus, one of the oldest of the family, has been considered by most botanists to belong to the *Barringtonieæ*, or has been regarded as an anomalous member of the *Myrtaceæ*; but my analysis demonstrates that it is truly *Lecythidaceous*. The most prominent rank is here given to it, as the typical genus of the family, because, from its more regular development, it affords a key to a better comprehension of the singular structure found in the other genera. It differs little, in fact, from *Couroupita* and *Cariniana* except in the regularity of its development, all the parts being quite similar in their nature and position. *Grias* more nearly approaches it in the regularity of the parts of the androphorum, although these are more stunted in growth.

Gustavia, Linn.

Pirigara (in parte), Aubl.; *Jeniparandiba*, Marcg.

Calyx adnatus, limbo brevi, aut integro, vel in lobos 4–6 diviso. *Petala* 6–8 magna, inæqualia, oblonga, concava, valde imbricata, expansa, unguibus ad discum agglutinata. *Discus* epigynus, annularis, planus. *Androphorum* magnum, petaloideum, ambitu orbiculare, et petala excedens, centro excisum, et ad ungues petalorum hinc adnatum, et deinde cum petalis deciduum, imo usque ad medium, in cyathum latum, brevem, carnosulum, e laminis plurimis extus gradatim majoribus arcte agglutinatis formatum, laminarum marginibus liberis, et undique in lacinias, seu *appendiculas*, numerosas, subulato-loriformes fimbriatim divisis, serie interiore brevi, reliquis imbricatim sensim longioribus, om-

nibus incurvatis et circa stylum conniventibus, singulis sub apicem obtusulum staminiferis; *Stamina* hinc numerosissima, brevissima, æqualia; *filamenta* filiformia tenuia; *antheræ* lineares, 2-lobæ, 2-sulcæ, apice poris 2 dehiscentes; *pollen* lenticulare, subtriquetrum. *Ovarium* inferum, semiglobosum, aut læve, vel angustissime alatum, 6-loculare, *ovulis* in quoque loculo pluribus, a placenta axillari protrusa funiculis suspensis; vertice intra discum depresse pulvinato, radiatim striato: *stylus* brevis, umboniformis: *stigma* minutum, obsolete lobatum. *Pyxidium* globosum, pomi molis, paullo sub apicem *zona calycari* lineari e sepalis marcidis cinctum; *vitta interzonali* brevi, subintrorsum convexa; *zona superiore* circulari, integra; *operculo* orbiculari depresse convexo, concavo aut planato, imo *columella* angulata amplificata: *pericarpium* tenuiter coriaceum, sublignosum, læve vel 6-alatum, loculis 6, vel abortu paucioribus, dissepimentis in pulpam carnosam reductis: *semina* in quoque loculo 6, vel abortu pauciora, fabæ mole, in pulpa nidulantia, *funiculis* oblongis paullo minoribus carnosis intus spiraliter fibrosis suspensa: *testa* crustacea, nitida, summo micropyle magna signata: *integumentum internum* tenue: *embryo* exalbuminosus, *cotyledonibus* 2 ovalibus, plano-convexis, carnosis, *radicula* supera, brevi, tereti, *plumula* conspicua immersa.

Arbores *vel* arbusculi *Americæ meridionalis, frondosi*; folia *alterna, oblonga, subserrata, breviter petiolata, sæpe conferta*: flores *terminales vel axillares, fasciculati, magni, albi, rosei aut flavi, sæpe odorati*; pedicelli *medio 2-bracteolati*; bracteæ *parvæ*.

1. Gustavia augusta, Linn. Dissert. Pl. Surinam. p. 17, cum icone; Amœnit. Acad. viii. 266, tab. 5; Linn. fil. Suppl. 313; Willd. Sp. iii. 846; DC. Prodr. iii. 289 (excl. syn.): *Gustavia augusta*, var. *Guianensis*, Berg in Mart. Fl. Bras. fasc. 18, p. 470, tab. 56 (excl. tab. 55); in Linn. xxvii. p. 442: *Gustavia urceolata*, Poit. Mém. Mus. xiii. 156, tab. 5; DC. Prodr. iii. 289: *Gustavia insignis*, Willd. hb.: *Gustavia meizocarpa*?, Gaertn. Fr. ii. 264, tab. 138: ramulis angulatis, striatis, fuscis; foliis majusculis, alternatim confertis, oblongo-lanceolatis, a medio deorsum sensim cuneatis, apice gradatim obtusatis, aut subacutis, supra medium distincte serratis, vel crenulatis, leviter chartaceis, supra viridibus, nervis divergentibus juxta marginem nexis, semiimmersis, reticulatis, subtus paullo pallidioribus, opacis, nervis costatis venisque reticulatis prominentibus, petiolo semitereti, fusco, limbo 24-plo breviore: floribus axillaribus, solitariis, vel 2–4 congestis, maximis, speciosis; pedicellis longis, validis, apice crassioribus, supra medium 2-bracteolatis; calycis limbo brevissimo, integro, crenulato, subreflexo; petalis 8, quorum 4 majoribus, 2 multo minoribus, oblongis, unguiculatis, crassiusculis, rosaceo-albis, extus granulatis et griseo-puberulis, intus parce tomentellis; androphoro magno, extus punctulis pallidis minute granulato; ovario infero, hemisphærico, ecostato, puberulo, 6-loculari, ovulis plurimis ad axin funiculis suspensis, vertice intra discum elevatum concavo, glabro, granulato; stigmate parvo fere sessili, 6-lobo, umbonato: pyxidio pyriformi-globoso, viridi, lævi; zona calycari paullulo sub apicem lineari, integra; vitta interzonali angustissima; operculo orbiculari, plano, centro breviter umbonato; pericarpio tenuiter coriaceo, 6-loculari, paucispermo; seminibus oblongo-ovatis, nigris, funiculis crassis longis torte corrugatis suspensis.—In Guiana (Poiret): *v. s. in hb. Hook.* Surinam (*Hostmann*, 276), Guiana (*Talbot*), Guiana (*Schomburgk*), Guiana (*Appun*, 1856), fluv. Maná (*Sagot*, 268), Cayenne (*Martin*), Brasilia (*Burchell*, 10,080), *in hb. Mus. Brit.* Guiana (*Martin*), Guiana (*Aubl.*), Surinam (*sine nom. in hb. Smith.*).

This species was originally described and well figured by Linnæus in 1775; another

good account, with an excellent figure, was afterwards contributed by Poiteau. Berg, however, has created much perplexity by figuring a very different species, and confounding with it several other plants. It seems confined to Guiana; for Burchell's specimen from the vicinity of Pará, from its paler leaves and different aspect, probably belongs to some other species. It grows chiefly in the savannas, forming a tree 20–40 feet high, with a trunk 1 foot in diam., with thick branches; the leaves, approximated at the end of the branches, are 10–18 in. long, $2\frac{1}{2}$–$4\frac{1}{2}$ in. broad, on a petiole $\frac{1}{4}$–$\frac{3}{4}$ in. long, and with about 20 pairs of nerves: the peduncle, about $\frac{3}{4}$ in. long, bears 2–4 pedicels 2 in. long, with 2 small opposite bracts in the middle: the flower expanded is 6 in. across; the larger petals are $2\frac{3}{4}$ in. long, $1\frac{1}{2}$ in. broad; the cup of the androphorum is $1\frac{1}{2}$ in. broad, the appendages of the outer row are 9 lines long, all converging to the centre; anthers $1\frac{1}{2}$ lin. long, sublinear, 2-celled, opening by 2 pores at the apex and supported by a short slender filament: the globular pyxidium, turbinate at base, truncated at the summit, is $2\frac{1}{8}$ in. in diam. in the middle: the interzonary band is about 1 line high, the flat umbonated operculum is $1\frac{1}{2}$ in. in diam.; the seeds are 1 in. long, $\frac{5}{8}$ in. broad, smooth, suspended by a twisting plicated fleshy funicle of nearly its length.

Gaertner's drawing of the fruit probably belongs to some other species, as it is more globular, deeply sulcated and subtorulose. Sagot's specimen also belongs to another species, as the bracts are placed near the summit of the pedicel.

2. GUSTAVIA SUPERBA, Berg in Linn. xxvii. 444: *Gustavia augusta*, DC. (non Linn.) Prodr. iii. 289: *Gustavia angustifolia*, Seem. (non Bth.) Bot. Her. p. 126: *Gustavia insignis*, Hook. Bot. Mag. tab. 5069: *Pirigara superba*, H. B. K. vii. 262: ramulis glabris, pallidis, striatis, cicatrisatis, fistulosis: foliis congestis, lanceolato-oblongis, imo spathulato-cuneatis et fere sessilibus, apice acute acuminatis, remote et argute serratis, glaberrimis, translucenter submembranaceis, utrinque pallidissime viridibus et opacis, nervis tenuibus, divaricatis, arcuatim nexis, prominulis, transversim valde reticulatis, subtus costa nervisque stramineis prominentibus, petiolo glabro, semitereti, lineatim marginato, limbo 9–10plo breviore: racemo brevi, terminali, vel e trunco nascente; floribus purpurascentibus, odoriferis; rachi petiolo paullo longiori; pedicellis alternatim congestis, puberulis, infra medium bracteolis 2 parvis imo connatis munitis; calycis limbo brevi, integro, vel obsolete 6-lobato et crenulato; petalis 8, oblongis, quorum 4 angustioribus, intus albis, extus rubescentibus, ungue flavo; androphoro albo; ovario turbinato, ecostato, glabro, vertice depresso, velutino: fructu flavo-viridi, eduli. In Nova Granada, prov. Carthagena, prope Turbaco (*Bonpland*): *v. s. in herb. Hook.* prov. Panama (*Seemann*, 579), Nova Granada (*Barclay*), Ecuador (*Sinclair*).

This is a well-marked species, easily recognized by its large membranaceous reticulated leaves coarsely serrated on the margins, the inflorescence of fine handsome flowers springing from the trunk. It grows near Carthagena, where it is known by the name of Membrillo (Quince) from its edible fruit. It abounds in the inner parts of the province of Panama, where it forms entire forests; it is a tree 50 feet high, with a durable scentless wood, used for building; its branches are simple and erect, marked

by the cicatrices of the fallen leaves: the leaves are 9–24 in. long, $3\frac{1}{4}$–$5\frac{1}{4}$ in. broad, on a petiole 1–$2\frac{1}{2}$ in. long, and with about 20 pairs of nerves; the pedicels in the bud are $\frac{3}{4}$ in. long, but they finally attain a length of $2\frac{1}{2}$ in.; the petals are 2 in. long, $1\frac{1}{4}$ in. broad.

Sir Wm. Hooker's drawing of this species, under the name of *Gustavia insignis*, was taken from a plant cultivated at Kew, and sent by Linden, probably from New Granada.

3. GUSTAVIA CONFERTA, Spruce MSS.: *Gustavia augusta*, var. *conferta*, Berg in Mart. Fl. Bras. *l. c.* p. 471: ramulis pallide brunneis, interrupte striatis, lenticellatis; foliis elongato-oblongis, imo sensim cuneatis, supra medium angustioribus et in acumen obtusulum gradatim attenuatis, marginibus inferioribus integris, sursum vix aut leviter serratis, dentibus obtusis, tenuiter chartaceis, supra fusco-viridibus, opacis, nervis patentim divaricatis, intra marginem arcuatim nexis, costaque paullo prominulis, subtus leviter brunneis, opacis, valde reticulatis, costa nervis venisque prominentibus, petiolo brevissimo aut vix ullo: racemo axillari, brevi, 3–4-floro; rachi brevi, fusca, angulato-striata; pedicellis confertim alternis, crassiusculis, sulcatis, ferrugineo-pruinosis, supra medium 2-bracteolatis; calycis limbo brevissimo, rotundato-undulato, obsolete 6-lobato, ferrugineo-opaco; petalis 6–8, spathulato-oblongis, carnosulis, in alabastro ferrugineo-pulverulentis: ovario turbinato, ecostato, fusce opaco, granulatim ruguloso, 6-loculari, vertice intra discum subplanum griseo-pubescente; stylo brevissimo, conico; stigmate brevissimo 6-lobo, intus papilloso. In Brasilia, *v. s. in herb. Hook.*; in Amazonas inter Santarem et Barra (*Spruce*, 1165); Rio Negro, Parahuámirim dos Ramos (*Spruce*, 1011); Rio Negro (1574 bis, sub *G. fastuosa*).

A species very different from *G. augusta*, of which it was considered to be a variety by Dr. Berg; but it differs in its leaves being darker, of more lurid hue, almost sessile, and in its smaller flowers. It is a small tree, 5–15 feet high; its leaves are 8–10 in. long, $2\frac{1}{2}$–3 in. broad, on a petiole $\frac{1}{2}$–$\frac{3}{4}$ in. long. The rachis of the inflorescence is only a few lines long; the pedicels $\frac{3}{4}$–1 in. long; the flower expanded is $4\frac{1}{2}$ in. in diam.; the spathulate petals 2 in. long, 1 in. broad; the androphorum $1\frac{1}{2}$ in. in diam.

4. GUSTAVIA LACINIOSA, nob.: *Gustavia augusta*, var. *calycaris* in parte, Berg, *l.c.* p. 471: foliis approximatis, elongato-oblongis, vel elliptico-oblongis, a medio deorsum sensim angustioribus, imo in petiolum subito acutis, apice breviter et obtuse acuminatis, marginibus laciniose et grosse serratis, chartaceis, glaberrimis, supra viridibus, nervis subpatentim divaricatis juxta marginem arcuatim nexis, subtus luride viridibus, petiolo subtenui, limbo 14-plo breviore: racemo terminali, 4–6-floro, floribus odoriferis; pedicellis alternis, medio 2-bracteolatis; calycis limbo 6-dentato, dentibus late rotundatis; petalis roseis, margine pallidioribus; androphoro albo: ovario turbinato, ecostato: fructu flavido-viridi (sicco fusco), lenticellis flavidis crebre maculato, subgloboso, supra basin paullo constricto et sub zonam calcycarem coarctato; hæc undulatim 6-loba, membranacea; vitta interzonali brevissima; zona

superiore integra. In Brasilia: *v. s. in herb. Hook.* ad ostium Rio Negro (*Spruce*, 1574 in parte sub *G. augusta*): *v. fruct. s. in Mus. Kew.* (*Spruce*, 1574, sub *G. fastuosa*).

It is a bushy tree, 15–20 feet high, with leaves 12–13 in. long, $3\frac{3}{4}$ in. broad, on a petiole $\frac{3}{4}$–1 in. long, and about 22 pairs of nerves: the raceme is about 3 in. long, the pedicels, 3–6 lines apart, are 1–$1\frac{1}{2}$ in. long. The pyxidium is $1\frac{1}{4}$ in. long, $1\frac{1}{2}$ in. broad in the middle, contracted to $1\frac{1}{4}$ in. below the calycary zone, which is $1\frac{1}{2}$ in. in diam., the interzonal band 1 line high; upper zone $1\frac{1}{4}$ in. in diam.

In the form of its leaves it approaches *G. superba*, but differs in their much thicker texture, coarser and blunter teeth, a more obtuse acumen and more slender, longer, distinct petioles, in the more slender inflorescence, ecostate ovary, with 6 acute teeth. For the same reasons it differs from *G. conferta* and *G. calycaris*, with which it is confounded by Berg.

5. Gustavia Antillana, nob.: ramulis pallidis, opacis, profunde sulcatis: foliis confertis, cuneato-lanceolato-oblongis, supra medium sensim acuminatis, marginibus subrevolutis, crenato-serratis, rigide chartaceis, utrinque pallidissimis, opacis, nervis divaricatis juxta marginem nexis, costa supra striolata prominula, subtus prominente, fulvida, striolata, nervis venisque reticulatis prominentibus, petiolo supra convexiusculo, subtus convexo, striolato, subpruinoso: inflorescentia ignota: pyxidio subparvo, globoso, sub zonam coarctato; zona calycari lineatim circulari: vitta interzonali angustissima, horizontali; zona superiore circulari; operculo concavo; pericarpio tenui, crustaceo, pallide brunneo, lenticellis granosis flavidis crebre maculato. In Antillanis: *v. s. in herb. Hook.* S. Vincente (*Guilding*, sub *G. hexapetala*), *v. fruct. s. in Mus. Kew.* (*Guilding*).

A species remarkable for its extremely pallid rigid leaves and the smallness of its fruit. The leaves are 8–10 in. long, $2\frac{1}{4}$–3 in. broad, on a stoutish flattened petiole $\frac{1}{2}$ in. long; the specimen has no flower; the pyxidium is 1 in. high, $1\frac{3}{8}$ broad in the middle; the calycary zone, scarcely prominent, is 1 in. in diam.

6. Gustavia dubia, Berg; Linn. xxvii. p. 446 (excl. syn.): foliis oblongis, vel oblongo-lanceolatis, utrinque angustatis, medio subserratis, chartaceis, supra nervis subpatulis, tenuibus, prominulis, valde reticulatis, costa planiuscula, subtus costa prominente, nervis costatis, petiolo limbo 16–20plo breviore: inflorescentia ignota: pedicello fructifero longo, medio minute 2-bracteolato; fructu globoso, lævi, tenuissime velutino. In Nova Granada ad fluv. Magdalena (spec. malum in Mus Berolino, *herb. Willd.*, no. 10155, sec. cl. Berg): *non vidi.*

This plant is evidently a *Gustavia*, to which Berg referred the *Lecythis elliptica* and *L. dubia* of Kunth, which most certainly are two very different plants. It appears to come very near *G. Antillana*: its leaves are $7\frac{1}{2}$–$8\frac{1}{2}$ in. long, $2\frac{1}{2}$–$2\frac{3}{4}$ in. broad, on a petiole 4–6 lines long; the peduncle of the fruit is $1\frac{1}{2}$ in. long, the pyxidium is $1\frac{1}{3}$ in. in diam. The specimen is said to be very incomplete.

7. Gustavia angustifolia, Benth. Voy. Sulph. p. 99; Seem. (non Benth.) Bot. Her. p. 126; Berg, Linn. xxvii. 443: ramulis crassiusculis, albidulis: foliis subsessilibus, anguste oblongis, basi longe sensim angustatis, apice acuminatis, acumine obtusulo, marginibus subrevolutis obsolete serratis, tenuiter chartaceis, supra viridibus, opacis, nervis planis et sulcatulis arcuatim nexis, venis valde reticulatis et prominulis, subtus paullo pallidioribus, nervis venisque prominentibus, utrinque opace pruinosis, petiolo brevissimo, aut vix ullo: floribus terminalibus, 3–4, subfasciculatis, sæpe e trunco nascentibus, griseo-puberulis, pedicellis striatis, imo bractea late lanceolata, et paullo sub apicem bracteolis 2 minutis donatis; calycis limbo brevissimo, subintegro, vel obsoletissime 6-lobo; petalis sæpius 6, oblongis, obtuse rotundatis, albis aut purpurascentibus, extus puberulis; ovario turbinato, ecostato, tomentello. In America tropicali: *v. s. in herb. Hook.* Columbia (*Hinds*).

A very distinct species: its leaves are 10–17 in. long, $2\frac{3}{4}$–4 in. broad, almost epetiolate; flowers sometimes appearing on the trunk; the pedicels are slender, 10 lines long; their basal bract is 4–5 lines long, the 2 minute bracteoles placed 2 lines below the apex; the limb of the calyx is extremely narrow; the petals are 11 lines long, 5 lines broad. Mr. Bentham states that the leaves are pellucid-punctate; but they have no pellucid glands, as in *Myrtaceæ*; the translucent dots are due only to the thinness of the parenchyma in the small areoles formed by the reticulations of the coarse veins.

This species differs from *G. superba*, from the same region, in its smaller, more chartaceous, almost sessile leaves, subpuberulous on both sides, and much smaller flowers.

8. Gustavia pubescens, Ruiz et Pav. vol. ined. p. 306, tab. 351; Berg in Linn. xxvii. 443: foliis sessilibus, spathulato-oblongis, imo sensim longe et gradatim angustatis, supra medium latioribus, apice breviter acuminatis, serrulatis, chartaceis, supra opacis, glabris, nervis utrinque circ. 62 divaricatis marginem versus arcuatis, puberulis, subtus molliter pubescentibus, nervis costatis, costaque media prominentibus, et tomentosis: inflorescentia ignota: floribus speciosis, magnis, petalis ovali-oblongis, coriaceis. In Ecuador ad Guayaquil: *non vidi.*

The specimen in the Berlin herbarium, according to Berg, consists only of a single leaf, a few petals, and an androphorum; but all the other details are derived from Ruiz's details and his drawing: from these it appears a very good species. The leaves are $32\frac{1}{2}$ in. long, 7 in. broad above the middle, 10 lines broad at the insertion; so that they must be somewhat auriculated at their base: the petals of their handsome flowers are 2–$2\frac{1}{2}$ in. long, 15–17 lines broad. It is sufficiently distinct from the preceding species.

9. Gustavia gracillima, nob.: ramulis pallidis, profunde sulcato-striatis, sparse lenticellatis, apice creberrime foliiferis; foliis lanceolato-linearibus, sub medium sensim spathulatis et in petiolo longe decurrentibus, apice gradatim attenuatis, acumine obtusulo, tenuissime chartaceis, flaccidis, marginibus subundulatis et crenulato-

serrulatis, dentibus brevibus, obtusulis, utrinque pallide viridibus et valde opacis, nervis numerosissimis, divaricatis, intra marginem adscendentibus, supra semi-immersis, subtus prominulis, costa utrinque prominente, petiolo tenuissimo, elongato, tereti, superne marginato, limbo 7plo breviore: racemo plurifloro; pedicellis crebre approximatis, tenuibus; floribus majusculis, speciosis; calycis limbo brevissimo, crenulato; petalis 6, elongato-oblongis, obtusis; ovario infero, ecostato. In regno Granatensi: *v. s. in hb. Hook.*, Nova Granada (*Purdie*).

A very distinct and beautiful species, apparently with pendent slender branches, crowded at the extremity with slender leaves: the leaves are 10–13½ in. long, 1 in. broad, on a very slender petiole 1½–2 in. long: the petals are 3 in. long, 1 in. broad.

10. Gustavia verticillata, nob.: ramulis virgatis pallidis, striatis, cum axillis remotiusculus; foliis in verticellis pluribus, congestis, recurvis, pro genere parvis, anguste oblongis, utrinque acutis, marginibus cartilagineis, integris vel subundulatis, glabris, rigide chartaceis, supra pallide viridibus, ad nervos sulcatis, opacis, nervis tenuibus, patentibus, longe intra marginem arcuatim nexis, subprominulis, subtus paullo pallidioribus, opacis, costa striolata nervisque flavescentibus prominentibus, petiolo tenui, canaliculato, marginato, limbo 4plo breviore: floribus in axillis paucis, vel terminalibus 4–5 congestis, mediocribus; pedicellis breviusculis, recurvis, pallide brunneis, striatis, rigide puberulis, supra medium bracteolis 2 ovalibus munitis; calycis limbo angustissimo, integro, crenulato; petalis 8, anguste oblongis; androphoro magno, cupulari; ovario turbinato, subparvo, obsolete costato, puberulo, vertice intra discum angustum plano, opaco, stylo brevi umbonato. In Nova Granada: *v. s. in hb. Hook.*, prov. Mariqueta, Rio Magdalena (*Triana*, 4167).

A species very distinct from all others; its virgate branchlets are 1½ line thick, with axils about 1½ in. apart: leaves about 5 in each verticel, very pendulous, 4–7 in. long, 1¼–2 in. broad, on a petiole 1–1½ in. long; pedicels 6 lines long, with 2 bracts 1 line long, placed 4 lines above the base; the calycine limb is 5 lines in diam.

11. Gustavia speciosa, DC. Prodr. iii. 289; Berg in Linn. xxvii. 445: *Pirigara speciosa*, H. B. K. Nov. Gen. vii. 262: foliis maximis, oblongo-lanceolatis, infra medium longe spathulato-angustatis, imo breviter obtusatis, apice in acumen obtuse acutum attenuatis, marginibus integris aut undulato-sinuatis, rigide chartaceis, supra dense viridibus aut pallidioribus, opacis, nervosis, creberrime reticulatis, costa valida, subtus viridibus, opacis, costa nervisque flavidis prominentibus, petiolo semi-tereti, canaliculato, fusco, limbo 8plo breviore: racemis terminalibus, vel trunco enatis, 4–5-floris; pedicellis tomentosis, medio bibracteolatis; floribus speciosis albis vel roseis, odoriferis; calycis limbo angusto, obsolete lobato, utrinque pruinoso; petalis 6, maximis, oblongis, carnosis, quorum 3 sæpe angustioribus: ovario turbinato, minime 6-costo, tomentoso, 6-loculari, vertice concavo, albide tomentoso; stylo breviter conico, glabro, 6-sulcato: fructu 6-loculari. In Nova Granada ad Mariquita (*Bonpland*) et in Brasilia: *v. s. in hb. Hook.*, Rio Negro, Barcellos (*Spruce*, 1535); Barcellos, gapo de Barraroa (*Spruce*, 1933).

A bushy tree 20–30 feet high, on the Rio Negro. The leaves are 9–24 in. long, $3\frac{1}{2}$–4 in. broad, on a petiole 1–$2\frac{1}{2}$ in. long, with about 30 pairs of nerves: the peduncle is about 2 in. long; the pedicels 2–3 lines apart, are $\frac{1}{4}$ in. long; the limb of the calyx sub-6-lobed, $1\frac{1}{2}$ line broad; the petals 2–3 in. long. The species is well distinguished by the long petioles of its large lanceolate leaves. I have not adopted Berg's amended diagnosis, because it was altered to embrace the following species. Spruce's plants are here considered to be specifically the same as Bonpland's plant from Mariquita, as there is scarcely any difference in the characters assigned to it.

12. Gustavia latifolia, nob.: *Gustavia speciosa*, Benth. (non DC.), Pl. Hartw. p. 176; Berg, Linn. xxvii. 445: foliis cuneato-oblongis, imo gradatim spathulatis, ad medium ample latioribus, apice acumine brevi obtusulo constrictis, marginibus subintegris, aut obsolete serratis, irregulariter repando-crenatis, submembranaceis aut flaccide chartaceis, supra viridibus, pruinoso-opacis, ad nervos divaricate arcuatim nexos sulcatulis, subtus pallidioribus, flavescentibus, opacis, minute granulosis, subpuberulis, costa nervisque prominentibus; petiolo semitereti, elongato, fusco, limbo 5–6plo breviore: racemis abbreviatis, 4–8-floris, ramis vetustis enatis, pedicellis longiusculis, congestis, subvalidis, flavide tomentoso-puberulis, imo bractea rotundata concava, et supra medium bracteolis 2 minutis munitis; calycis limbo brevi, crassiusculo, patenter subcampanulato, irregulariter crenato; petalis 6, ovato-oblongis, puberulis, albis: ovario hemisphærice turbinato, obsolete 6-costato, granulato, ferrugineo-pubescente, 6-loculari, vertice intra discum crenato-pulvinatum concavo, radiatim striolato et tomentoso; stylo brevissimo umbonato: fructu eduli. In America tropica: *v. s. in hb. Hook.*, Guaduas in prov. Bogota (*Hartweg*, 981), Panama (*Seemann*, sine num.).

This is a slender tree 30–40 feet high; its leaves are $10\frac{1}{2}$–12 in. long, $4\frac{1}{4}$–$4\frac{3}{4}$ in. broad, on a petiole $2\frac{1}{4}$–$2\frac{1}{2}$ in. long, having about 18 pairs of nerves; the inflorescence sometimes terminal, more generally springing from the wood of its bare branches, has a thick peduncle $\frac{1}{2}$ in. long, bearing almost fasciculated flowers; the stout pedicels are curved, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, the basal bract 3 lines long, and broad, and 2 minute bracts 3 lines below the summit; the limb of the calyx is $\frac{1}{2}$ line broad and 9 lines in diam.; the flower expanded is $2\frac{1}{2}$ in. or more in diameter.

The species is very distinct from *G. speciosa*, to which it has been referred: although approaching it in its lengthened petioles, the leaves are double the breadth in proportion, obtusely and shortly constricted at the apex (not long and sharply acuminated at the summit), and having only 18 pairs of nerves (instead of 30): in the Panama specimen the leaves are more glabrous, and the petiole flatter.

13. Gustavia pulchra, nob.: foliis elongato-oblongis, imo longe spathulatis et in petiolo decurrentibus, a medio sursum latioribus, apice subrotundatis, supra medium repando-serratis, marginibus revolutis, chartaceis, supra viridibus, opacis, nervis tenuibus prominulis, costa convexa, subtus luride fuscioribus vel hepatice viridibus, valde opacis, nervis pluribus prominentibus, venis transversim reticulatis, petiolo

subtenui, canaliculato, fusco, limbo 35plo breviore: racemis subbrevibus, expansis, alternatim 6–10-floris, (trunco enatis?); floribus magnis, roseis, odoriferis; pedicellis subtenuibus, longiusculis, rugulosis, opace ochraceis, pruinosis, angulato-striatis, ultra medium 2-bracteolatis; calycis limbo anguste et breviter acute 6-dentato; petalis 8, oblongis, carnosulis, in alabastro albido-tomentosis; androphoro magno, subgloboso, appendiculis tenuibus: ovario turbinato, obsolete 6-costato, pulverulento, vertice subconcavo, reticulato; stylo breviter conico, 6-sulcato; stigmate niveo 6-radiato coronato. In Venezuela et Brasiliæ confinibus: *v. s. in herb. Hook.*, Rio Casiquiare (*Spruce*, sine num.), Rio Uranacuá (*Spruce*, 1933).

A tree 20–30 feet high, growing by the side of rivers, and apparently confined to the upper tributaries of the Rio Negro; it is near *G. speciosa*, differing, as Dr. Spruce well observes, in the thinner texture of its leaves, a less number of nervures, in their more spathulate form, rounded on the summit, decurrent at base, on a shorter petiole, more numerous flowers on longer and more slender pedicels, bracteolated above the middle, the calycine limb more distinctly and acutely lobed. The leaves are 17–25 in. long, 3–4½ in. broad, on a petiole ½–¾ in. long, with about 24 pairs of nerves, at a distance from each other of 10 lines: the raceme, apparently torn from the trunk, has a peduncle 1–2 in. long, pedicels 1½–2¼ in. long; limb of calyx 1½ line long, 7 lines in diam.; the petals 2–2¼ in. long, ¾–1 in. broad; the flower expanded is 4½–5 in. in width. I have corrected the locality given by Spruce, the river properly spelled is Uaranacuá (not Uanauaca); it is near Carvocira.

14. Gustavia Marcgraaviana, nob.: *Gustavia augusta*, Berg in parte (non Linn.) in Mart. Fl. Bras. fasc. 18. p. 469, tab. 55, 56: *Janiparandiba*, Marcg. Bras. cap. 9, p. 109; *Japarandiba*, Pis. 9. p. 172: ramulis crassiusculis cinerascenti-brunneis, striolatis, lenticellis verruculosis: foliis crebre alternis, subsessilibus, oblongis vel lanceolato-oblongis, imo sensim cuneatis, ultra medium amplioribus, apice in acumen subacutum gradatim aut subito attenuatis, margine tenui nervigero vix revoluto serratis, flaccide chartaceis, supra læte viridibus, subnitentibus, costa tenui, nervis tenuibus paullo prominulis, venis crebriter transversis reticulatis, subtus fere concoloribus, costa valida, striolata, nervis costatis, venis prominulis, petiolo lato, brevissimo, sæpe nullo: floribus speciosissimis, in ramulis novellis ex axillis brevissimis terminalibus; rachi brevissima, pluribracteolata, 1- ad 6-flora; pedicellis subvalidis, pallide opacis, glabris, angulato-striatis, crebre granulatis, paullo ultra medium bracteolis 2 parvis acutis donatis; calycis limbo brevissimo, integro, undulatim recurvulo; petalis 9, quorum 6 maximis, oblongis, obtusis, imo sensim unguiculatis, utrinque lævibus, glabris, subinæqualibus, carnosulis, planis, albis?, siccis aureo-luteis; androphoro magno, subgloboso, fusciore, subtus hemisphærice cupulato, margine et intus appendiculis longis lineari-subulatis crebre pluriserialibus incurvatis staminigeris munito: ovario infero, turbinato, ecostato, opace pruinoso, 4-loculari, ovulis plurimis, a placentis crassis centralibus appensis et cum funiculis multiseriatis radiantibus, vertice intra discum elevatum subconcavo, sparsim albide piloso;

stylo brevi, conico; stigmate minimo, 4-lobatim globoso: pyxidio subgloboso. In Brasilia: *v. s. in herb. variis*, Pernambuco (*Gardner*, 1022).

A small tree, common in woods near Pernambuco; its branchlets are $\frac{1}{4}$–$\frac{3}{8}$ in. thick, with a soft wood, almost fistulous, or filled with a large quantity of pith; the axils are alternately 3–4 lines apart; the leaves are 6–18 in. long, 3–5 in. wide, on a broad petiole 1 line long, or sometimes decurrent to its base, and they have about 20 pairs of nerves: the pedicel is $1\frac{1}{2}$ in. long, with 2 bracteoles, 1 in. above the base, 1 line long, and puberulous: the flower expanded is $5\frac{1}{2}$ in. in diam.: the calycine border is $\frac{1}{2}$ line broad, very crenulated and undulated; the unequal petals are $1\frac{1}{2}$–$2\frac{1}{4}$ in. long., $\frac{3}{4}$–1 in. broad; the cup of the androphorum is $1\frac{1}{2}$ in. in diam., its outer appendages 9 lines long, $\frac{1}{2}$ line broad. I doubt much whether the pyxidium figured by Berg under *G. augusta* belongs to this species. I therefore do not cite the dimensions he gives of it. According to Marcgraaf, it is rather larger than an apple, flatly truncated at the summit, 2 or 3 hanging together in a bunch, greyish externally, yellow within: the seeds are oblong, the size of an almond-nut, shining, somewhat angular, and cordate where they are attached to the coiling thick funicles. The plant of Gardner is unquestionably identical with the *Janiparandiba* of Marcgraaf from the same locality, and is certainly distinct from *G. angusta*, Linn., to which it is referred and figured in Berg's plates 55 & 56.

15. Gustavia longifolia, Pöpp.: Berg in Mart. Fl. Bras. *l. c.* 472; in Linn. xxvii. p. 442: arbor parva; foliis magnis spathulatis, sessilibus, apice obtusiuscule acutatis, leviter serrulatis, chartaceis, supra cano-virentibus, opacis, creberrime et subtilissime punctatis, nervis crebre parallelis, subpatulis, marginem versus adscendentibus, prominulis, subtus puberulis, nervis venisque tenuissimis reticulatis prominentibus: racemis 1–4-floris e trunco vel ex axillis inferioribus ortis; pedicellis puberulis, infra medium 2-bracteolatis, bracteolis minimis, ovatis; calycis limbo fere integro, vel breviter rotundiusculo et 3–4-lobo; petalis 8, obverse oblongis, alternatim angustioribus, roseo-purpureis: ovario infero, turbinato, puberulo, vertice depresse orbiculari, 4-loculari, loculis pluriovulatis; stylo obsoleto; stigmate obsolete 4-sulcato: pyxidio globoso, sanguineo, 3–4-loculari, 3–4-spermo; seminibus obovatis. In Peruvia, ad Yurimaguas, in prov. Maynas (*Pöppig*, 2094): *non vidi*.

A small tree 6 feet high, scarcely ramose, called *Chope* or *Sachavaya* by the natives. The leaves are $1\frac{1}{2}$–2 feet long, 5–$7\frac{1}{2}$ in. broad above the middle, 10–18 lines broad at the sessile base, and without petioles; pedicels 8–16 lines long; lobes of calyx 2 lines broad, $\frac{1}{2}$ line long; greenish petals, broader ones 1 in. long, 5 lines broad; androphorum 5 lines long, incurved; filament 4 lines long, anther bursting at summit by 2 short longitudinal fissures; ovary 4 lines long; disk 5 lines in diam.; pyxidium 2 in. in diam., with a single seed in each cell; a very distinct species, remarkable for its large, very broad, sessile leaves, with very close parallel nerves, and puberulous beneath; flowers of moderate size, upon long pedicels.

16. Gustavia Pœppigiana, Berg in Mart. Fl. Bras. *l. c.* p. 471; Linn. xxvii. 442: foliis

in apice ramulorum congestis, elongato-oblongis, imo longe et anguste sensim spathulatis, apice obtusatis, aut breviter obtuse acuminatis, repando-serratis, glabris, nervis plurimis, erecto-patulis, intra marginem adscendentibus, utrinque prominentibus, petiolo limbo circ. 60plo breviore; racemo brevi, terminali, plurifloro; pedicellis brevibus, medio 2-bracteolatis; calycis limbo brevi, integro; petalis albis, demum roseis; ovario infero, turbinato, velutino, 4-costato; pyxidio globoso, majusculo, 4-costato, cinereo-viridi, summo plano, 4-loculari. In Alta Amazonas, ad Ega (Pöppig, 2658): *non vidi.*

A species very near *G. speciosa*, apparently differing only in its shorter petioles, and somewhat smaller flowers: its leaves are 6–16 in. long, 2–5 in. broad above the middle, on a petiole 1 to 3 lines long, and with about 20 pairs of nerves: the pedicels are 4 lines long, bracteoles oval, $1\frac{1}{2}$ line long; ovary 4 lines long; petals 2 in. long; fruit 3 in. in diam.; seeds cuneately angular.

17. Gustavia calycaris, nob.: *Gustavia augusta*, var. *calycaris*, Berg in Mart. Fl. Bras. *l. c.* p. 471: ramulis fusco-griseis, rugulosis; foliis sæpius maximis, oblongo-lanceolatis, imo longe spathulato-angustatis, et in petiolum sensim obtusatis, supra medium sensim latioribus, sursum gradatim angustioribus, et in acumen acutum constrictis, marginibus fere integris aut undulato-sinuatis, rigide chartaceis, supra viridibus, opacis, nervis tenuibus utrinque circ. 24 remote divergentibus, juxta marginem nexis, vix prominulis, costa prominula, striolata, subtus paullo pallidioribus, nervis fulvidis, prominentibus, venis transversim reticulatis, petiolo subvalido, subcanaliculato, fulvido, limbo 30plo breviore: racemo axillari, brevi, alternatim 10-floro; rachi opace brunnea, striata; floribus speciosis, roseis, odoratis; pedicellis longiusculis, angulato-sulcatis, fusco-pruinosis, paullo sub apicem bracteolis 2 lineari-acutis munitis; calycis limbo brevi, in dentes 4 latos acutos rotatos diviso, utrinque pruinoso; petalis 10, valde imbricatis, subæqualibus, ovato-oblongis, carnosulis, roseis, utrinque griseo-opacis et pulverulentis: ovario turbinato, fusco-tomentoso, leviter 4-costato, 4-loculari, vertice intra discum elevatum valde concavo, flavide opaco; stylo brevi, conico, umbonato; stigmate inconspicuo. In Amazonas: *v. s. in herb. Hook.*, inter Santarem et Barra (*Spruce*, sine num.); Rio Negro usque ad Solimões (*Spruce*, 1574); Rio Negro (*Spruce*, 1574 *bis*, sub *G. fastuosa*).

This species is very distinct from *G. conferta*, and is noted by Berg as differing from it by its 4-lobed calyx; but he has confounded the specimens of Spruce's plants referred to them respectively. Spruce says it is a bushy tree, 15 to 20 feet high; its leaves are 10–14 in. long, 2–$3\frac{3}{4}$ in. broad, on a petiole 4–6 lines long, with nerves diverging at a distance of $\frac{3}{4}$ in. apart in the larger leaves; the raceme, apparently axillary, is about $2\frac{1}{2}$ in. long; the pedicels $\frac{3}{4}$–$1\frac{1}{4}$ in. long, with bracteoles $\frac{1}{2}$–1 in. above the base, each 3 lines long: the flower expanded is $3\frac{1}{2}$ in. broad; the limb of the calyx is subquadrate, 1 line long at the lobes, $\frac{1}{2}$ line broad in each sinus, the lobes opposite to the slender costal ridges; the petals $1\frac{1}{2}$–2 in. long, $\frac{3}{4}$ in. broad; the androphorum is white; the fruit of a yellowish-green colour.

18. Gustavia Ruiziana, Berg, in Linn. xxvii. 444; *Gustavia augusta*, R. & P. (non Linn.), in Fl. Peruv. tom. v. ined. p. 117, tab. 485: ramulis crassis, cortice rugoso, suberoso; foliis spathulato-lanceolatis, imo longe angustatis, apice acuminatis, leviter serratis, chartaceis, supra glabris, nervis utrinque 30, subdivaricatis, juxta marginem adscendentibus, haud prominulis, reticulatis, subtus puberulis, nervis prominentibus, costa crassiuscula; petiolo valido, limbo 20plo breviore: floribus plurimis, congestis; pedunculis validis, tomentellis, supra medium minute 2-bracteolatis; ovario infero ecostato calyceque leviter 4-lobo tomentellis. In Ecuador ad Guayaquil (*Ruiz*): *non vidi*.

This species appears to differ from *G. angustifolia* in its petiolated, thicker, narrower leaves, glabrous above, and its 4-lobed calyx; from *G. augusta* in its petiolated thinner leaves, puberulous below, subdivaricately costate nerves, tomentose pedicels, and 4-lobed calyx. The leaves are 19 in. long, 3 in. broad, on a petiole 16 lines long: the pedicels are 2–2½ in. long.

19. Gustavia pterocarpa, Poit. Mém. Mus. xiii. 158, tab. 6 et 7; DC. Prodr. iii. 290; Hook. Bot. Mag. 5239: *Gustavia fastuosa* (in parte), Berg (non Willd.), in Mart. Fl. Bras. *l. c.* p. 473; Linn. xxvii. 446: cortice suberoso, rufescente; ramulis brunneis, profunde et interrupte striatis, rugosis, et subverruculosis; foliis elongato-ellipticis, imo cuneatim angustioribus, valde acutis, apice in acumen breve acutum vel obtusulum constrictis, distincte repando-serratis, rigide chartaceis, supra viridibus, ad nervos sulcatis, nervis tenuibus, subpatentibus, subimmersis, costa tenui, subtus pallidioribus, opace flavescentibus, costa nervisque nitenti-rubidulis et prominentibus, petiolo fusco, subtenui, canaliculato, marginato, limbo 16plo breviore: floribus terminalibus, 3–6 congestis; pedicellis angulosis, pruinoso-puberulis, medio 2-bracteolatis, bracteolis acutis; calycis limbo ad basin in sepala 6 diviso, sepalis lanceolato-triangulatis, acutis, fuscis, crassis, erectis, utrinque granulato-rugulosis, marginibus undulato-crispatis; petalis 6, quintuplo longioribus, oblongis, obtusis, subunguiculatis, subæqualibus, albis, imo subroseis, extus ad basin niveo-tomentosis, intus lævibus: ovario infero, turbinato, ferrugineo-opaco, granulato, alis 6 angustis undulato-crispatis et imo mucronatis, sepalis alternis donato, 6-loculari, pluriovulato, vertice intra discum plano, pruinoso; stylo brevissimo, obtuso; stigmate parvo, radiatim 6-lobato, albo: pyxidio globoso, crispatim 6-alato, calyce persistente coronato, operculo plano, umbonato. In Guiana: *v. s. in herb. Hook.*, fluv. Maná (*Poiteau*); Acarauari (*Sagot*, 950); Surinam (*Hostmann*, 1210): *in herb. Mus. Brit.*, Guiana (*Sagot*, 950).

A species confined to the region of Guiana, forming a tree 30 feet high, growing in moist places, with a trunk 1 foot in diam., having a yellowish hard wood with a fetid smell: its leaves are 5–10 in. long, 2–3 in. broad, on a petiole 5–8 lines long, and with about 12–14 pairs of nerves; the pedicels are ¾–1¼ in. long, with 2 bracteoles 2 lines long near the middle; the flower-buds, ½ in. in diameter, are snow-white and tomentose; the flower expanded is 2–2¾ in. across; the sepals 3 lines long, 2½ lines broad; the petals 10–14 lines

long, 5–7 lines broad; the cup of the androphorum is 8–10 lines broad, the slender appendages 6 lines long, ½ line broad; the pyxidium in an immature state is 2½ in. in diameter. This species, as elsewhere stated, was wrongly confounded by Dr. Berg with *G. fastuosa*, Willd.; but it is well distinguished from it by its congested terminal inflorescence, its larger flowers on pedicels 2-bracteolated at base, its ovary with broader more undulated wings, terminating at their base in a mucronate tooth, and crowned with 5 long broad sepals carinated within, in its larger whiter petals, in its winged fruit double the size.

20. Gustavia brasiliana, DC. Prodr. iii. 290 (excl. var. β); Mart. Med. Bras. p. 72; Berg in Mart. Fl. Br. *l. c.* p. 472, tab. 7. fig. 160 (excl. syn.); in Linn. xxvii. 446: ramulis crassiusculis, fuscis, profunde sulcatis, rugulosis; foliis superioribus crebre congestis, inferioribus sparsis, ovato-ellipticis, imo sensim cuneatis, medio latioribus, apice in acumen breve obtusulum recurvulum subito constrictis, ad marginem cartilagineum subrevolutum repando-undulatis et obsolete serratis, rigide chartaceis, supra fusce et profunde viridibus, subopacis, costa prominula, striolata, nervis tenuibus, patente divaricatis, marginem versus arcuatis, paullo prominulis, subtus pallidioribus, hepatice rubescentibus vel rubro brunnescentibus, opacis, costa nervis venisque transversis reticulatis prominentibus, petiolo latiusculo, late marginato, fusco, limbo 12plo breviore: floribus terminalibus 5–6, subfasciculatis, magnis, odoriferis; pedicellis subvalidis, acute angulatis, fuscis, pruinoso-tomentellis, medio 2-bracteolatis; calycis limbo in sepala 6 diviso, laciniis late triangularibus, acutis, coriaceis, granulatis, opace pulverulentis, fuscis, persistentibus; petalis 6, magnis, obovato-oblongis, subconcavis, albis; ovario infero, turbinato, alis 6 sepalis alternis angustis undulato-crispatis munito, fusco, granulatim strigoso, 6-loculari, pluriovulato, vertice intra discum latum valde elevatum margine intus acutum subconcavo, opaco, sparse puberulo; stylo brevi, angulato, umboniformi; stigmate parvo, inflexim lobato: pyxidio subgloboso, anguste 6-alato, operculo concavo calyce coronato, flavo, abortu 2–5-loculari; seminibus in quoque loculo 4–6, subglobosis, pallide flavis, nitidis. In Brasilia, Rio Negro, prope Garupá (*Martius*): *v. pl. s.* (*cum floribus*) *in herb. variis*, San Carlos, Rio Uahaupes, Rio Negro (*Spruce*, 2514).

A handsome spreading tree, 20–30 feet high, with leaves 4–9 in. long, 1¼–3 in. broad on a petiole 5–7 lines long, with 18–20 pairs of spreading nerves; the pedicels are 1–1½ in. long, with 2 small bracts above the middle; flowers 7 in. across, white, odoriferous; ovary 6 lines in diam.; sepals 3 lines long and broad; androphorum 1 in. broad; pyxidium (according to Martius) 1½ in. in diam., crowned by the persistent sepals 8 lines long.

This species, which is confined to the region of the Rio Negro, approaches *G. pterocarpa*, agreeing in its winged ovary and fruit crowned by 6 acute sepals; but it differs in its more approximated, much darker, broader, more rigid leaves, with more numerous and more patent nerves, with a broader and stouter petiole, and finally by its much larger flowers. Berg was certainly wrong in making it identical with the *Janiparandiba*

of Marcgraaf and Piso. It differs from *G. fastuosa* in its terminal congested raceme, larger flowers, winged ovary and fruit, both crowned by 6 broadly triangular sepals.

21. Gustavia fastuosa, Willd. Sp. Pl. iii. 847; DC. Prodr. iii. 290; Berg in parte (non Willd.) in Mart. Fl. Bras. *l. c.* p. 473: *Pirigara hexapetala*, Aubl. Pl. Gui. i. 490, tab. 193: ramulis fuscis, striatis, cortice rimoso, lenticellato; foliis sparsis, cuneato-ellipticis, imo sensim angustatis, supra medium latioribus, apice in acumen subbreve recurvulum acutissimum subito attenuatis, margine grossule dentatis, supra fusco-viridibus, vix nitidis, nervosis et reticulatis, petiolo subcrasso, semitereti, canaliculato, limbo 16plo breviore: floribus in axillis solitariis, mediocribus; pedicello longiusculo supra medium 2-bracteolato; calycis limbo longiusculo, in sepala 6 acute triangularia coriacea diviso; petalis 6 late ovatis, subunguiculatis, rotundatis, albis, carnosulis; androphoro albo; ovario infero, turbinato, vix costato, 6-loculari: pyxidio parvo, calyce coronato, operculo concavo, abortu 4–5-loculari, loculis 1-spermis. In Guiana et Amazonas: *v. s. in herb. Mus. Brit.*, Cayenne in sylvis (*Aublet*); Cayenne (*Van Rohr*); Guiana (*Martin*): *in herb. Hook. et alior.*, Santarem (*Spruce*, 827); Lago de Quiriquira (*Spruce*, 525); Santarem (*Spruce*, 1019).

A tree 15 to 20 feet high, growing in moist woods, with a spreading head and a trunk $1\frac{1}{2}$ foot thick, with a hard yellowish fetid wood, and called *Pirigaramépe* by the natives; its leaves are 4–6 in. long, $1\frac{3}{4}$–$2\frac{1}{2}$ in. broad, on a petiole 3–4 lines long, with about 12 pairs of nerves; the pedicel is 1 in. long; the ovary is 3 lines long, not costate, as Berg affirms, crowned by a short ring formed by the united sepals, which are 3 lines long; the petals are 6–10 lines long, 4–6 lines broad; the fruit is globular, greyish, smooth, 14 lines in diam., by abortion 4–5-locular, each cell containing a single oval seed 9 lines long, 4 lines broad, suspended by a thick fleshy funicle of equal length.

This species was established by Willdenow upon the materials furnished by Aublet. Dr. Berg was quite unjustified in confounding it with another very distinct species, well figured and described by Poiteau (*G. pterocarpa*): its chief distinguishing features are its alternate flowers, their smaller size, the acutely 6-lobed limb of the calyx, the wings of the ovary vanishing at base, and its much smaller smooth greyish fruit, by abortion 4–5-locular, with monospermous cells. Berg's diagnosis of the species is therefore rejected, and its characters are remodelled above, in unison with Aublet's materials.

2. Couroupita. (Plate XXXIII. B.)

Couroupita, Aubl.: *Pekea* (in parte), Juss.

Calyx adnatus, limbo 6-sepalus; *sepala* subparva, subrotundata, convexa, crassiuscula, æstivatione subimbricata. *Petala* 6, rarius 7, majuscula, oblonga, valde concava, expansa, imbricata, unguibus ad discum androphorumque agglutinatis. *Discus* epigynus, annularis, planus. *Androphorum* magnum, petaloideum, ambitu valde gibbosum, imo cupulare, poculiforme, et in centro excisum, subtus ad ungues petalorum discumque agglutinatum, supra staminigerum, latere antico in *ligulam* marginibus subparallelis æquilatam et duplo longiorem expansum, hinc carnosulum, et sensim incurvatum, deinde in *galeam* concavam semiglobosam latiorem super stylum inflexam auctum, appendiculis nume-

rosissimis staminigeris tereti-clavatis munitum, iis intra cupulam brevioribus, crebriter erectis, intra galeam longioribus, undique echinatim creberrimis et imbricatis. *Stamina* parva, apici appendicularum insita; *filamenta* tenuiter filiformia, brevia, erecta; *antheræ* ovatæ, 2-lobæ, lobis collateralibus, medio ad filamentum affixis, rima longitudinali extus dehiscentibus. *Ovarium* inferum, semiglobosum, 6-loculare; ovulis in quoque loculo plurimis, funiculis a placenta axillari bilamellatim prominente suspensis, anatropis, vertice intra discum annularem alte pulvinatum radiato-crenatum valde concavo; *stylus* subnullus; *stigma* in cavitate sessile, subglobosum, 6–8-sulcatum, apice 6–8-radiatum, radiis glutinosis. *Pyxidium* majusculum, globosum, circa medium *zona calycari* sublineari cinctum; *vitta interzonali* fere semiglobosa; *zona superiore* valde minore, orbiculari, integra: *operculum* parvum, vix elevatum, subtus ad columellam conjunctum: *pericarpium* crassissimum, ponderosum; *epicarpio* subosseo, textura granoso, duro; *mesocarpio* submolli demum deliquescente et effugiente, hinc vacuum reliquit (an semper?); *endocarpio* crasso, osseo, primum 6-loculari, deinde dissepimentis columellaque in pulpam resolutis, pulpa firme carnosa, subglutinosa, 1-loculari, 30–40-spermo: *semina* ovata, *funiculis* totidem carnosis pubescentibus dimidio brevioribus suspensa; *testa* subcoriacea, velutino-pubescens, circa *hilum* magnum rimosa: *integumentum internum* membranaceum: *embryo* exalbuminosus, *radicula* æquilonga, tereti, ad hilum superne spectante, *cotyledonibus* 2, modo hippocrepiformi adscendentibus, magnis, foliaceis, corrugato-plicatis.

Arbores *Americæ tropicæ et Antillanæ sæpe procerrimæ*, trunco *crasso, valde ramosæ*: folia *elliptico-oblonga, petiolata, nervis parallelis divergentibus*: inflorescentia *racemosa*.

1. Couroupita Guianensis, Aubl. Pl. Guian. ii. 708, tab. 282; Poit. Mém. Mus. xiii. 152, tab. 7; DC. Prodr. iii. 294; Berg in Mart. Fl. Bras. *l. c.* p. 475; in Linn. xxvii. 461: *Lecythis bracteata*, Willd. Sp. ii. 1174: *Pekea Couroupita*, Juss.: ramulis crassiusculis, rugosis, cicatricibus foliorum post lapsum signatis, brunneis, cinereo-pruinosis, apice creberrime foliiferis: foliis elongato-oblongis, imo obtusiuscule obtusis, apice sensim obtusis vel in acumen breve obtusum repente constrictis, marginibus subintegris vel obsoletissime crenulatis, chartaceis, supra profunde viridibus, subnitidis, nervis numerosis, tenuibus, parallele divergentibus, intra marginem arcuatim nexis, flavidulis, costaque tenui semiimmersis, subtus pallidioribus, subnitidis, vel subopacis, costa crassiore prominente, pruinosa, nervis tenuibus venisque transversim reticulatis prominentibus; petiolo tenui, subtereti, subpuberulo, marginibus tenuibus valde involutis, limbo 10plo breviore: racemis e trunco vel e ramis nudis ortis, folio fere æquilongis; rachi valida, rectiuscula, alternatim nodosa; pedicellis persistentibus, imo bractea fere æquilonga acuta decidua munitis, apice bracteolis 2 minutis signatis: floribus majusculis, ad pedicellos articulatis, plerumque caducis, odoratis; sepalis 6, ovalibus, crassis, concavis, viridibus; petalis 6, quorum 4 majoribus, 2 minoribus, oblongis, concavis, roseis, unguibus pallidis carnosis; androphoro albo-roseo, appendiculis rufis; ovario infero, turbinato, 6-loculari, vertice intra discum elevatum subconvexo; stylo nullo; stigmate globoso, radiatim 6-sulcato: fructu globoso, ut in charactere generico. In Guiana: *v. s. specim. typic.* (sine flore) *in herb. Mus. Brit.*, Cayenne (*Aublet*).

This is a tree stated by Aublet to have a thick trunk, 20–30 feet high, often more than 2 feet in diameter. The leaves in the typical specimen are 6–12 in. long, $2\frac{1}{2}$–4 in. broad, on a petiole 7–10 lines long, with 22–24 pairs of nerves, all conjoined within the margin;

the rachis of the raceme is 12 in. long, judging from Aublet's figure of a diminished size, and bearing 10 or 12 alternate flowers. Poiteau relates that these racemes are often seen on the bare branches of preceding years, or upon the main trunk, often attaining a length of 3 feet, and bearing 100 flowers, each on a pedicel $1\frac{1}{2}$–2 in. long, with 1 bract at its base and 2 at its summit: from Aublet's drawing, allowing for the diminution of the figure ($\frac{1}{3}$), the pedicel would appear to be nearly 1 in. long, the flower expanded 4 in. across; the lobes of the calyx 3 lines long and broad; the petals, $1\frac{3}{4}$ in. long, are of a pale rose-colour; the pyxidium is globular, 6 in. in diam., the pericarp nearly $\frac{1}{2}$ in. thick, the epicarp and endocarp hard and ligneous; the mesocarp subfleshy, which, becoming gelatinous, escapes and leaves a hollow in its place; the pericarp is filled with pulp enclosing numerous oval seeds, each suspended by a long fleshy funicle: the seeds constructed as shown in the introductory remarks, and as I have figured them. Poiteau's description of the fruit, derived from Tussac's details, refers to *C. Antillana*.

2. Couroupita Surinamensis, Mart., Berg in Mart. Fl. Br. *l. c.* p. 476, tab. 57, 58, 59; Linn. xxvii. 462: ramis transversim rimosis, glabris, junioribus compressis, badiis: foliis sparsis, oblongis, imo obtusis aut subacutis, apice sensim obtusate angustioribus, remote glanduloso-denticulatis, submembranaceis, nervis plurimis patule divergentibus vix prominentibus, transversim reticulatis, costa paullo prominente, subtus pallidioribus, costa nervisque prominentibus, puberulis, in axillis barbatis; petiolo canaliculato, pilosiusculo, limbo 5–6plo breviore: racemo terminali, folio sublongiore; rachi validissima, angulata, puberula, multiflora; pedicellis validis, longiusculis, suberectis, apice bracteolis 2 parvis oppositis, et imo bractea oblonga obtusa ciliata puberula decidua munitis; floribus majusculis; sepalis 6, rotundato-ovatis, subinæqualibus, imo in cupulam brevissimam connatis; petalis ovali-orbicularibus, concavis, crassiusculis, albo-roseis; androphoro albo; antheris mucronulatis; ovario semiinfero subhemisphærico, 5–7-loculari, ovulis numerosis, a placenta centrali funiculis tenuibus suspensis; stylo parvo, depresse orbiculari, vertice intra discum convexo; stigmate sessili, 8-radiato, papilloso: pyxidio speciei typicalis mole, pericarpio scrobiculato-verruculoso; pulpa purpurea. In Guiana Batava, Surinam, prope Paramaribo (*non vidi*).

A very large tree; the axils of the leaves are 2–3 lines apart: the leaves are 3–6 in. long, 1–$2\frac{1}{2}$ in. broad, on a petiole 8–12 lines long, with about 18–20 pairs of parallel nerves: the rachis of the raceme is 6–12 in. long; pedicles $\frac{1}{2}$–$\frac{3}{4}$ in. apart, 8–12 lines long; its basal bracts are 4 lines long, its upper bracts 2 lines long. The flower expanded is $3\frac{1}{2}$–4 in. in diam.; the larger petal $2\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. broad, the smaller ones $1\frac{1}{4}$ in. long, 1 in. broad; the androphorum $\frac{3}{4}$ in. in diam., and $1\frac{1}{4}$ in. long when extended; the calyx expanded is 9 lines in diam., its sepals 3 lines long, 2 lines broad. It appears to me there must be a mistake in Berg's drawing of the ovary in his plate 57 (lower flower), where it is represented as being quite superior and globose; and this is repeated in plate 58, in its longitudinal section (third line, last figure). In all the species I have seen, the ovary is more than semiinferior, with a convex vertex; and that

this ought to be the case here is proved by his drawing of the fruit, where the line of the calycary zone is shown somewhat above the middle.

3. Couroupita Nicaraguensis, DC. Prodr. iii. 294; Œrst. Myrt. p. 16; Berg in Linn. xxvii. 462: *Lecythis Nicaraguaensis*, Moç. & Sess. Fl. Mex. Icon. ined. Species vix nota: foliis obtusis; calycis margine lobato; petalis obtusis. In America centrali prope Nicaragua: *non vidi*.

This scarcely known species is said to differ from *C. Guianensis* in its obtuse leaves, smaller flowers, of a reddish white colour, and the blue tint of the pulp of the fruit. Perhaps it scarcely differs from the *C. odoratissima* of Seemann, which may be said to grow in the southern limit of the same region.

4. Couroupita Antillana, nob.: *Couroupita Guianensis*, Hook. (non Aubl.) Bot. Mag. lix. tab. 3158; Tuss. Ant. ii. tab. 10 et 11; Descot. Ant. v. 349; Crüger, Linn. xxi. 737: ramulis patentibus, subvalidis, teretibus, sulcatis, glabris, lævibus, rufescentibus; foliis in apice ramulorum congestis, elongato-oblongis, sub medium valde angustatis et cuneatim acutis, apice subobtusato-acutis, aut breviter acuminatis, integris, vel obsolete serratis, submembranaceis, supra pallide viridibus, nervis subpatule divaricatis et subcrebre parallelis prominulis, costa tenui, vix prominula, subtus pallidioribus, costa nervisque tenuissimis paullo prominulis et obsolete puberulis; petiolo tenuissimo, puberulo, limbo 10plo breviore: racemis in trunco et ramis annosis longis, multifloris; pedicellis subproximis, longis, subtenuibus, erectiusculis, persistentibus, imo bractea oblonga et apice bracteolis 2 parvis munitis; floribus maximis, cum pedicellis articulatis, et hinc sæpe caducis; sepalis ovatis, subacutis, erectis, margine ciliolatis, æstivatione quincuncialiter imbricatis; petalis 6, rarius 7, magnis, 2 exterioribus amplioribus, obovatis, expansis, extus flavide roseis, intus sanguineo-lilacinis; androphori basi late orbiculari galeaque lata incurva appendiculis multiseriatis staminigeris, in illa clavatis, in hac longioribus teretibus, rubris intus tectis, ligula lata nuda; ovario infero, vertice intra discum annularem alte convexo; stigmate fere sessili, 6-radiato: pyxidio globoso, 8-pollicari. In Antilles: *v. s. in hb. Hook.*, San Vincente (*Guilding*); Trinidad (*Lockhart*).

A tree 50–60 feet high, with a trunk more than 2 feet thick, and a soft wood; leaves $7\frac{1}{2}$–10 in. long, $2\frac{3}{8}$–3 in. broad, on a rather slender downy petiole $\frac{3}{4}$ in. long, with about 24 pairs of nerves: the racemes, growing upon the trunk and old bare branches, are 1–3 feet long, with sometimes as many as 100 flowers of a somewhat crimson colour, each 5 in. broad when expanded; the peduncle of the raceme is straight, about 3 lines thick, closely beset with the suberect pedicels, which are persistent, about $1\frac{1}{2}$ in. long, with a larger bract at base and 2 small oblong bracteoles at the summit, where the caducous flowers are articulated; hence the trunk and main branches have the appearance of being armed with numerous spiny shoots; the turbinated adnate calyx is crowned by 6 rounded sepals, 3 lines long and broad; petals roundish, concave, fleshy, unequal, imbricated and expanded, yellowish outside with a tinge of red, crimson-lilac within, $1\frac{3}{4}$–2 in. long, $1\frac{1}{2}$–2 in. broad; androphorum large, 2 in. in diam., its basal ring $1\frac{1}{2}$ in.

across, closely beset with numerous short fusiform staminiferous appendages; anthers small, oval, yellow; ligula $1\frac{1}{4}$ in. long and broad; appendages of hood reddish, 6 lines long; the inferior ovary is 6-celled, surmounted by a prominent epigynous disk, on which the base of the androphorum and claws of the petals are agglutinated; within its concavity the vertex of the ovary rises in a cupola-form, with an almost obsolete style terminated by a 6-rayed stigma. The pyxidium, from an outline sketch round Mr. Guilding's drawing, would seem to be 8 in. in diameter.

The species differs from *C. Guianensis* in being a tree of much greater height, in its more cuneated leaves, more acute at the apex, in its much longer racemes, with more numerous flowers much greater in size and differently coloured, and much larger fruit.

5. Couroupita Peruviana, nob.: ramulis teretibus, validiusculis, fusco-rufescentibus, luride opacis, sulcato-angulatis, apice crebre foliiferis; foliis oblongis, a medio deorsum sensim angustioribus, imo obtusis, et hinc in petiolo breviter decurrentibus, apice obtusis, breviter obtuse aut acutiuscule acuminatis, margine obsoletissime serrulatis, tenuiter chartaceis, supra viridibus, nervis plurimis, rectiusculis, parallele divaricatis, subimmersis, venis tenuissimis, reticulatis, subtus pallidius viridibus, opacis, costa striata prominente, nervis imo barbatis venisque crebre reticulatis prominentibus; petiolo supra sulcato, subruguloso, parce puberulo, limbo quadruplo breviore: racemis axillaribus; rachi longissima, crassissima, simplici vel in ramos 3–5 alternos interdum divisa, angulato-sulcata, ochraceo-pruinosa, verruculosa, multiflora; pedicellis longiusculis (rarius bifurcatis et 2-floris), subvalidis, rectis, subadscendentibus, firme persistentibus, imo bractea parva ciliata et apice bracteis 2 calycem involucrantibus munitis; floribus cum istis articulatis, plerumque caducis, majusculis, odoratissimis; sepalis suborbicularibus, valde convexis, extus granulato-rugulosis, puberulis, margine anguste membranaceis et ciliatis; petalis majusculis, late oblongis, concavis, imo breviter unguiculatis, carnosulis, extus pallide carneis, intus rubris vel lateritiis, siccitate flavide punctulatis, extus granoso-rugulosis; androphoro albo, ligula rubra; ovario turbinato, 6-sulcato, subinfero, flavide pulverulento, 6-loculari, ovulis plurimis axi affixis, vertice intra discum alte pulvinatim annularem convexo, et stylo brevi obtuso umbonato; stigmate majusculo, depresse orbiculari, 6-lobato, lobis sulcatis: pyxidio majusculo, fere globoso, imo angustato, apice subdepresso, paullo supra medium zona calycari sublineari cincto, 6-loculari. In Peruvia alta: *v. s. in hb. variis*; Tarapota, in sylvis secus rivulos (*Spruce*, 4495).

A very large tree about 100 feet high, with a softish wood, known by the name of Aiaúma (*caput mortui*), probably from its large round fetid fruit. The axils at the ends of its pendent branchlets are close, about $\frac{1}{2}$ line apart; the leaves are 4–$5\frac{1}{2}$ in. long, $1\frac{3}{4}$–2 in. broad, on a petiole $\frac{3}{4}$–1 in. long, with 18–20 pairs of straight parallel nerves: the rachis of the inflorescence is 2–3 lines thick, 8–9 in. long, with axils 3 lines apart; the nearly erect persistent pedicels are 9–12 lines long and 1–$1\frac{1}{4}$ line thick; the oval bracts at the apex of each pedicel are 2 lines long and broad, concealing the ovary, which is articulated upon the pedicel; the sepals are $1\frac{1}{2}$ line long and broad; the fleshy

petals are 18 lines long, 13 lines broad, flesh-coloured outside, brick-red within; the androphorum is 4 lines in diam., white, with a reddish ligula. The pyxidium, according to Spruce's notes, is almost globular, 7–7½ in. in diam., somewhat narrower towards the base, rather depressed above, with a linear zone a little above the middle, showing there the vestiges of the sepals; the upper zone and operculum are small; the pericarp is ¾ in. thick, the epicarp and endocarp hard and osseous, the latter subtomentous inside; the fleshy mesocarp, becoming fluid, escapes, and leaves the space it occupied quite empty; the 6 fleshy dissepiments, at first firm and distinct, are soon resolved into a mucilaginous pulp, which envelops many smallish seeds arranged in 2 series: this pulp on exposure to the air becomes black and fetid. It is used by the natives to cure skin-diseases in animals.

This species in many respects approaches *C. Surinamensis*, especially in the hairy tufts in the axils of the nerves; but it differs in its larger leaves upon longer petioles, more numerous nerves, in the more slender persistent pedicels of the inflorescence (not articulated at the base), in its smaller flowers, in its much larger fruit not quite spherical.

6. Couroupita odoratissima, Seem. in Hook. Kew Journ. iii. 301; Bot. Her. p. 126: ramis divergentibus; ramulis validiusculis, teretibus, pallide opacis, striatis, lenticellis flavidis odoriferis crebre verruculosis: foliis oblongis, imo sensim cuneatis, apice in acumen breve repente constrictis, integerrimis, vel obsolete sinuatis et minute denticulatis, margine ciliatis, tenuiter membranaceis vel subchartaceis, supra viridibus, vix nitidis, sparse pilosulis, nervis tenuibus plurimis parallelis patentim divaricatis haud prominulis, venis transversim reticulatis, costa tenui, subimmersa, subtus concoloribus, sparse puberulis, in nervis costaque prominulis densius pilosulis; petiolo crassiusculo, supra plano, subtus convexo, dense puberulo, limbo 15plo breviore; stipulis parvis, subcordatis, puberulis, caducissimis: racemis terminalibus, vel a trunco enatis, folium subæquantibus; rachi valida, angulato-sulcata, glanduloso-verruculosa, tomentosa, multiflora; floribus speciosis, odoratissimis; pedicellis sublongiusculis, rufo-tomentellis, demum glabratis, suberectis, imo firmatis, apice cum floribus articulatis; sepalis obtusis, ciliatis; petalis oblongis, obtusis, margine fimbriatis, carneolis, luteo-striatis; androphoro splendente aureo; ovario ut in spec. præcedente; stigmate 6-radiato. In Veraguas: *v. s. in hb. Hook.*, in sylvis Rio Jesus (*Seemann*, 1151).

A lofty tree, 60–80 feet high, growing in the forest, the trunk bare to the height of 20 feet, and bearing many racemes, with handsome flowers as large as those of a passion-flower, from a resemblance to which it bears the vernacular name of *Granadillo*: it is also called *Palo de paraiso*. The axils of its branchlets are ¾ in. apart; the leaves are 6–7½ in. long, 2½–3 in. broad, on a stout petiole 5–6 lines long, and they have about 20 pairs of slender parallel nerves arcuately joined near the margin; the rachis of the terminal raceme is 7 in. long, 2 lines thick; pedicels alternately 2–4 lines apart, 6–9 lines long, with flowers articulated on their summit, which are 1½–2 in. broad when expanded; stamens very numerous, crowded upon both the annular ring and head of the

androphorum, with very short capillary filaments seated upon dark tetragonous appendages truncated at their summit; anthers of 2 bright yellow oval lobes divaricated at their base; the fruit is unknown. The fragrance of the flowers can be perceived at a distance of half a mile.

7. Couroupita membranacea, nob.: ramulis teretibus, angulato-sulcatis, brunneis, glaberrimis, sublucentibus; foliis elongato-oblongis, deorsum sensim angustioribus et imo cuneatim acutis, apice in acumen breve obtusulum subito constrictis, marginibus obsolete et remote crenatis, cum dente parvo glanduloso, valde membranaceis, utrinque læte concoloribus, glaberrimis, supra nervis tenuissimis parallele divaricato-adscendentibus venisque transversim reticulatis prominulis, subtus costa tenui nervisque sparsim pilosulis et in axillis subbarbatis; petiolo tenuissimo, imo crassiore, canaliculato, puberulo, limbo 8–9plo breviore: racemis ultrapedalibus, a trunco enatis; rachi crassa, angulato-sulcata, pallide brunnea, puberula; pedicellis alternis, subremotis, imo firmatis, apice cum flore articulatis. In Nueva Granada: *v. s. in hb. Hook.*, Santa Marta, in planitiis ad Molinas in valle Dupar (*Purdie*).

This species, though in many characters approaching the preceding, is yet very distinct in its deeply sulcated glabrous branchlets, without the peculiar odoriferous glands that distinguish the Veraguas plant; it differs also in its longer racemes, much larger leaves, upon much longer and more slender petioles: a similar membranaceous texture of the leaves occurs in both the preceding species. It is a tall tree, occurring in plains (not in the forests), and, as in some other species of the genus, with the inflorescence issuing from the main trunk or its bare branches. The axils of its branchlets are $\frac{3}{8}$–$\frac{1}{2}$ in. apart; the leaves are $8\frac{1}{2}$–9 in. long, $2\frac{7}{8}$–$3\frac{1}{8}$ in. broad, on a slender petiole 1 in. long: the rachis of the racemes is much above a foot in length, with pedicels 3 lines apart and 8 lines long; the petals are very thick and dark when dry, when fresh are succulent, and yield a blue juice when squeezed.

8. Couroupita lentula, nob.: ramulis ramosis tenuibus, fusco-brunneis, subcompressis, striolatis, sparse verruculosis; foliis ovatis, vel oblongo-ovatis, imo obtusis, vel rotundiusculis, apice sensim acutis, aut subobtusis, crenato-serrulatis cum dentibus obtusis, membranaceis, friabilibus, supra viridibus, opacis, nervis tenuissimis venisque reticulatis immersis, subtus vix pallidioribus, fulvide opacis, costa nigra, tenui, prominula; petiolo tenui, limbo 15–18plo breviore: forma inflorescentiæ ignota; petalis oblongis, apice rotundatis, submembranaceis (an rubris? siccis fuscis), marginibus tenuissimis pallidis; androphoro majusculo, ligula sensim ampliata, striata, galea intus concava, appendiculis numerosissimis crebris staminiferis donata. In Brasilia: *v. s. in hb. Hook.*, Ilheos (*Moricand*, 2636, sub *Couroupita*).

The leaves are $2\frac{1}{4}$–$3\frac{3}{4}$ in. long, $1\frac{1}{4}$–$1\frac{3}{4}$ in. broad, on a petiole $1\frac{1}{2}$–2 lines long: there is no inflorescence on the specimen, only the petals and androphorum glued to the sheet; the latter has a broad oblique cup-shaped ring, widening considerably into a very broad naked ligula, continued into an inverted hood of equal length and breadth, which is

covered inside all over, somewhat laxly, with longish adpressed staminiferous appendages, the outer row fimbriating the margin: it is altogether, including the basal ring, 18 lines long, 6 lines broad, the hood being 7 lines long and broad; nearly the entire surface of the basal ring is crowded with short staminiferous appendages in many series. This structure is in confirmation of Moricand's determination that it is a species of *Couroupita*.

9. Couroupita crenulata, nob.: ramulis rufo- vel cinereo-brunneis, opacis, rugulosis, obsolete striatis; foliis ovalibus, aut late ovatis, imo rotundatis, subito brevissime acutatis, et in petiolo decurrentibus, apice rotundatis, et in acumen recurvatum brevissimum canaliculatis, in marginibus cartilagineis vix revolutis irregulariter crenatis, chartaceis, supra pallide viridibus, nervis tenuissimis subpatentibus vix prominulis, valde reticulatis, costa tenui, circa basin dilatata et plana, subtus fere concoloribus aut brunnescenti-viridibus, opacis, costa nervis venisque prominulis; petiolo supra plano, late marginato, margine involuto, limbo 8plo breviore: racemo terminali, folio longiore; rachi flexuosa, subcompressa, striolata; pedicellis patentibus, calyce brevioribus, fuscis, rugulosis; sepalis subrotundatis, rotatis, fuscis, granoso-rugosis; petalis suborbicularibus, inæqualibus, concavis, margine ciliatis; ovario infero, turbinato, subangulato, granoso, 4-loculari, ovulis in quoque loculo plurimis, e placenta axillari prominente, funiculis centrifuge radiantibus, vertice intra discum latiusculum paullo prominente, subconcavo, nitido, radiatim striato, margine crenato; stylo centrali, brevi, depresse globoso, 4-sulcato; stigmate sessili, hoc minore, depresse globoso, obsolete 4-lobo, lobis styli sulcis oppositis. In Brasilia: *v. pl. sicc. in hb. Mus. Brit.*, Bahia (*Blanchet*, 302), cum specimine ligni: *in hb. Hook.*, Ilheos (*Moricand*, 2417).

The sample of wood sent by Blanchet is about 3 inches in diameter; it may be part of the main stem, but more probably of one of its branches: the leaves are 3–4$\frac{3}{4}$ in. long, 2–2$\frac{3}{4}$ in. broad, on a petiole 3–4 lines long, with about 18 pairs of nerves arcuately conjoined far within the margin; the rachis is 5–6 in. long, bearing about 15 flowers, $\frac{1}{4}$–$\frac{3}{4}$ in. apart.

3. Bertholletia. (Plate XXXIII. c.)

The general features of this genus having been so amply demonstrated in the preliminary remarks (*antè*, p. 161 *et seq.*), no further observations are here necessary. Only a single species has been hitherto recorded; but I think two or more may easily be recognized in our herbaria.

Bertholletia, H. & Bonpl.

Calyx adnatus, limbo libero, breviter tubulato et poculiformi, 2-lobato, lobis tubo duplo longioribus, oblongis, rotundatis, valde concavis, patentibus, coriaceis, apice undulato-crenatis, vel obtuse 3-dentatis, demum circumscissis. *Petala* 6, oblonga, triplo longiora, inæqualia, nonnulla sæpe fissa et plura simulantia, imbricata, unguibus inter discum et androphorum agglutinata. *Discus* epigynus,

annularis, subplanus. *Androphorum* magnum, petaloideum, ejus *Couroupitæ* formâ, imo cupulatum, margine crenatum, centro excisum, intus *appendicibus* numerosissimis creberrime erectis brevibus clavatis apice staminigeris munitum, *ligula* paullo longiore et sensim latiore, nuda, incurva, *galea* gradatim reversa, semiglobosa, intus concava et appendiculis longiusculis lineari-subulatis sterilibus densissime echinata; *stamina* parva, in appendices basales solum insita; *filamenta* brevissima, filiformia; *antheræ* parvæ, ovatæ, 2-lobæ, lobis collateraliter adnatis, in sinu imo affixis, rima marginali longitudinaliter dehiscentibus. *Ovarium* inferum, semiglobosum, 4-sulcatum, 4-(rarius 5-)loculare, *ovulis* in quoque loculo 5, sessilibus, e basi radiatim erectis, vertice intra discum planum subconcavo; *stylo* tereti, leviter incurvo; *stigmate* minute globoso, papilloso. *Pyxidium* majusculum, globosum, longe vel paullo supra medium *zona calycari* lineari cinctum; *vitta interzonali* valde convexa; *zona superiore* minima, circulari, fauce intus declivi, vel acuta et subtus concava; operculo parvo, aut alte mammæformi, lævi, vel depresse pulvinato radiatim striato, et breviter umbonato, ore secedente intus retracto, subtus ad columellam agglutinato; *columella* cylindrica, 4-sulcata, apice attenuata, mox ad basin descendens, imum versus latior et seminifera; *pericarpio* crasso, ponderoso, *epicarpio* grosse corticoso, rimoso, sæpe resiliente; *endocarpio* crassiusculo, osseo, durissimo, extus leviter scrobiculato et pluricostato, intus plerumque 4-loculari, epulposo, dissepimentis columellaque siccatione demum evanidis. *Semina* in quoque loculo constanter 5, vel 8 triseriata, sine funiculo ad basin columellæ erectim affixa, oblonga, pressione acute triquetra corrugulatim rugosa, *hilo* versus angulum basalem signata; *testa* crasse coriacea, durissima, indehiscente, cum canalibus 3 intra angulos pertusa, his vestigiis vasorum spiralium ab hilo ad apicem adscendentium repletis, quæ mox in telam araneam per testam undique subdivisæ *raphen* valde sparsam constituunt: *integumentum internum* submembranaceum, brunneum, opacum, nucleo arcte adhærens. *Embryo* exalbuminosus, oblongus, utrinque obtusus, amygdalino-homogeneus, edulis; re vera *radicula* gigantea est, cujus neorhiza crassa, interna, ab exorhiza externa undique cincta, atque insuper ad extremitatem ab hilo remotiorem *cotyledones* 2 minutissimæ vix visibiles cum plumula lata in eis abscondita: in germinatione, plumula per cotyledones protrusa, *caulem* squamosum propullat; quandoque neorhiza, ex extremitate opposita expulsa, *radicem* efficit.

Arbores *Americæ tropicæ, giganteæ,* trunco *nudo, altissimo, crassissimo, superne valde ramoso*: folia *alterna, majuscula, ad apicem ramorum approximata, oblonga, utrinque subacuta, cum petiolo plus minusve elongato*: racemi *sæpe paniculati, axillares et terminales, multiflori*; rachi *crassa, geniculatim nodosa*; flores *fere sessiles, imo bracteis* 3 *deciduis donati, petalis cum androphoro simul caducis.*

1. Bertholletia excelsa, Bonpland, Pl. Æquin. i. 122, tab. 36; Poit. Mém. Mus. xiii. 148, tab. 4 (nec 8); DC. Prodr. iii. 293; Mart. Reise, 1130, pl. 11; Berg in Mart. Fl. Bras. *l. c.* p. 478; Linn. xxvii. 460: procera, ramis deflexis, ramulis teretibus, subangulatis, interrupte striolatis, fusco-brunneis, opace pruinosis, lenticellato-verruculosis; foliis oblongis, vel elongato-oblongis, imo subrotundatis, et in petiolum breviter acutatis, apice rotundatis, et in acumen breve acutum canaliculatim reflexum subito constrictis, subintegris, vel marginibus crenulato-undulatis, obsoletissime serratis, chartaceis, supra profunde viridibus, subopacis, minutissime granulatis, nervis tenuissimis, divaricatis, longe intra marginem arcuatim nexis, vix prominulis, venis immersis et laxe reticulatis, costa tenui, mox sensim latiore, et late canaliculata, pruinosa, subtus pallidioribus, fusco-umbrinis, pulverulento-opacis, nervis prominulis, costa crassiore, prominente, striolata; petiolo elongato, semitereti, marginibus latis valde introflexis, brunneo-pulverulento, corruguloso, limbo 6–10plo breviore: panicula racemiformi, terminali, folio æquilonga, cum ramo solitario elon-

gato erecto, vel racemo simplici axillari; rachi crassa, angulata, geniculata, nodis alternis prominulis et approximatis, circa 50-flora; floribus sessilibus, cum nodis articulatis, bracteis 2 obtuse ovatis stipatis; calycis limbo breviter cupulato, profunde fisso in sepala 2 ovata, apice obtuse 3-dentata, valde concava, patentia, coriacea, tomento brunneo opace pruinosa; petalis 6, ovato-oblongis, obtusis, concavis, ochroleucis; ovario infero, semigloboso, 4-loculari, ovulis triseriatim erectis, sessilibus, vertice intra discum subplano, radiatim striato; stylo subulato, subcurvato, sepalis dimidio breviore; stigmate minimo, papilloso-lobato: pyxidio majusculo, oblongo-ovali, cortice lævi, pallido, subcrasso, vix rimoso, paullo supra medium zona calycari lineata circulari notato; vitta interzonali convexa; zona superiore minima, fauce obtusa, superne concava; operculo alte mammæformi, a columella cylindrica mox soluto et caduco; endocarpio crassissimo, pallide lignoso, 4-loculari, vel e septis evanidis tandem 1-loculari, 40–60-spermo, seminibus imbricato-erectis. In America tropicali, Rio Orinoco (*Bonpland*) et in Guiana: *v. s. plant. in herb. variis*, Guiana (*Schomb.* 439); *in herb. Hook.*, Para (*Riedel*, 611); regione Amazonica (*Burchell*, 9473–9879): *v. fruct. in Mus. Kew.*, in Trinidade introd. (*Purdie*).

A magnificent tree, above 100 feet high, with a trunk $2\frac{1}{2}$ feet thick; the axils of the terminal branchlets are $\frac{3}{4}$ in. apart; the leaves are 8–24 in. long, $3\frac{1}{2}$–6 in. broad, on a petiole 9–18 lines long, and with about 25 pairs of nerves, with others intermediate and shorter. The terminal panicle is 8 in. long, with a single branch nearly equal in length, with a rachis 2 lines thick when dried, its zigzag turns (with prominent nodes) 2 lines apart; the oval bracts very small; the lobes of the calyx 7 lines long, 5 lines broad; the petals 15 lines long, 8 lines broad; the androphorum 1 in. in diam.; the pyxidium (Plate XXXVII. figs. 1–4) 6 in. long, 5 in. in diam., with a smooth palish lenticellated bark, which does not crack and fall off; the calycary zone, $\frac{3}{4}$ in. below the apex, is 3 in. in diam.; the opercular zone, 8 lines in diam., is contracted within into a depressed concave mouth, 6 lines in diam.; the operculum is cylindrical, 5 lines broad, 5 lines high, round and umbilicated at the summit; as the attached columella withers, it breaks away and falls off, as Bonpland has well shown both in his upper and lower figure; and this offers a marked distinction between this and the following species. Poiteau wrongly inferred two errors in Bonpland's drawings—one that in the lower figure the fruit is inverted, the other that the columella and mode of attachment of seeds are reversed: but this is not so; for Bonpland's drawing is quite correct. The pericarp is very thick, is originally 4-celled, with from 6 to 10 seeds in each cell, which can only escape after the decay of the shell.

2. Bertholletia nobilis, nob.: *Bertholletia excelsa*, Berg (non Bonpl.), in Mart. Fl. Bras. *l. c.* p. 478, tab. 60–61 quoad inflorescentiam et fructus; Poiteau (in parte) Mém. Mus. xiii. tab. 8 (nec 4); Hook. Kew Journ. ii. 74: procerrima, trunco crasso, ad alt. 100 ped. nudo, superne ramosissimo, ramis deflexis, ramulis validis, teretibus, fusco-brunneis, glauco-pruinosis; foliis oblongis, imo obtusatis et in petiolum subito

acutatis, apice rotundatis, et in acumen breve acutum repente constrictis, marginibus grossule et crenulato-serratis, supra sublucentibus, vix opacis, rufescenti-viridibus, subcoriaceis, nervis pruinosis patentibus arcuatim nexis, venis creberrime reticulatis, costa striolata, immersa, subtus pallide vel ochraceo-brunneis, subnitentibus, costa striolata nervisque prominentibus; petiolo valido, supra plano et marginato, subtus convexo, limbo 24plo breviore: panicula terminali, laxe ramosa, folio subæquilonga, ramisque vix crassis, longiusculis, patentissimis; rachi crebriflora, angulato-striata, rugulosa, prominenter nodosa; floribus sessilibus, cum nodis articulatis; calyce primum globoso, demum in lobos 2 diviso, lobis hemisphæricis concavis, crassiusculis, patentibus, apice obsolete crenulatis, extus pruinosis; ovario infero, turbinato, 4-loculari, vertice intra discum parvo, radiatim striato; stylo subbrevi, subinflexo. In regione Amazonica et Guiana: *v. s. in herb. Hook.*, Para (*Martius*); in Amazonas, sine loco (*Burchell*, 9226, 9314, 9879 in parte): *v. fr. s. in Mus. Kew.* (*Spruce*); *in Mus. Brit.* (sine loco).

This species differs from the former in its loftier growth, its immense trunk bare to a great height, stouter branches, leaves of a more rufescent hue, with more numerous closer nerves, more reticulated, on much shorter petioles, in its broader panicle with several long branches spreading horizontally, in the rounder and more entire calycine lobes. It forms a tree above 120 feet high, with a trunk 14 feet in diam. up to a height of 50 feet, and quite bare to the height of 100 feet; its leaves are 10–15 in. long, $3\frac{3}{4}$–$4\frac{1}{2}$ in. broad, on a petiole 3 to 6 lines long; the panicle is about 10 in. long, with about 5 horizontal branches 3–5 in. long; the floriferous nodes are $\frac{1}{4}$–$\frac{1}{2}$ in. apart. The fruit (Plate XXXVII. figs. 4–7) is globular, 4–$4\frac{1}{2}$ in. in diam., with a much thicker, rougher, darker, and more cracking resilient bark 3 lines thick; the endocarp is 4 lines thick, subosseous; the inconspicuous calycary zone is 9–12 lines below the summit; the upper zone, 6 lines in diam., has a sharp edge, concave and widening inwards; the operculum, of the same diameter, rises little above the mouth, is pulvinately depressed, radiately sulcated, shortly umbonate at the apex, persistently attached to the columella, which is at first slender, 4-angular, gradually swelling to the base into a club-shaped placenta, upon which the erect crowded seeds are affixed by a nearly basal ventral hilum; as this columella shrivels in drying, it draws along with it the operculum into the cavity of the cell; the cavity of the shell, originally 4-celled, becomes unilocular by the withering of the slender dissepiments, and contains 20 sharply triquetral seeds, which are closely compacted, entirely filling the cavity, without the trace of any pulp.

These seeds are known in commerce as Brazil nuts; the amount exported from Para alone in six months of the year 1863 was 18,862 alquieres; and from Manáos, on the Rio Negro, 9976 alquieres. Taking this to be the average export for 1 year, the yield amounts to about $2\frac{1}{2}$ millions of the fruits, or 50 millions of seeds, occupying the bulk of 60,000 bushels: this does not include the several other large quantities exported from the Rio Orinoco, Demerara, Cayenne, Maranhao, and other places. These seeds, in Brazil, may be valued at about 30 shillings per bushel. The hard fruits which fall to the ground are broken in the forests by Indians, where a man and a boy will break about

300 of them daily, yielding them about 2 alquieres of the nuts. The kernels of these nuts, broken in a similar manner, are subjected to pressure, when they yield an oil greatly esteemed for domestic purposes and for export, each pound of the kernels furnishing 9 ounces of oil, valued at 2 shillings per pound. This oil, according to Martius, consists, per cent., of 74 parts of elæine, and 26 of stearine. The finely laminated inner bark of the trunks is also a valuable article of commerce, especially adapted for the caulking of ships and barges, being worth about 18 shillings per cwt.

The question here naturally arises, how do the seeds germinate and strike root, confined as they are in an inextricable prison? For it is manifest they cannot find an exit through the opercular opening, and they cannot escape by any other means than by the rotting of the thick pericarp on moist ground; and it would probably require three years' exposure to the sun and moisture before so thick a shell could decay sufficiently to allow of the liberation of the seeds, and then perhaps another year's exposure before the thick testa of the seeds could rot sufficiently to allow the embryo to germinate. This shows an extraordinary power of vitality in the embryo, which would seem to remain four or five years in a dormant state. Oily seeds are generally supposed to ferment and decay soon; but that perhaps is where the oil-cells are contained in albumen; here, however, we find a reverse condition. I have been told that when the embryo of *Bertholletia* has been extricated, and planted under the most favourable circumstances, it takes a whole year before it begins to germinate. Is this inertness due to the large amount of stearine in the oil-cells, which preserves it from decay?

4. Lecythis. (Plate XXXIV. A.)

The many points of structure hitherto unknown to botanists, among the several plants referred to *Lecythis*, render it necessary to define the genus anew, and to separate from it all those species where, in the ovary, the ovules are erect, unsupported by funicles, and where in the fruit the operculum is not attached to a central columella, where the seeds are bitter (not edible), are not suspended in pulp by a large fleshy funicle or strophiole, but are always dry, erect, and attached to the base of the fruit by a large hilum. The species so distinguished from *Lecythis* proper are here described under the distinct genera *Chytroma*, *Eschweilera*, and *Jugastrum*. The androphorum in *Lecythis* is similar in structure to that of *Bertholletia*; that is to say, the imbricated appendages within the hood are always bare of stamens, terminating in flexible points, all centring around the style, where they form a kind of brush, the probable function of which is to collect and distribute the pollen derived from the fertile stamens placed over the epigynous disk. We find in *Chytroma* and *Eschweilera* an androphorum constructed as in *Bertholletia*; but not so in *Jugastrum*, where the appendages within the head bear fertile stamens, as in *Couroupita* and sometimes in *Lecythis*. These conditions form differential features by which *Lecythis* may at all times be easily distinguished from other genera of the family: its diagnosis may now be summed up in the following manner:—

Lecythis, Lœfl., Linn.

Calyx adnatus, limbo libero in *sepala* 6–7 brevibus diviso. *Petala* 6–7, multo majora, sæpius inæqualia, oblonga, subreflexa, unguibus intra discum et androphorum semel agglutinata et cum androphoro caduca. *Discus* epigynus, annularis, planus. *Androphorum* magnum, petaloideum, ei *Bertholletiæ* simile, imum annulare disco agglutinatum, intus appendiculis brevibus erectis staminiferis creberrimis munitum; *ligula* nuda, carnosa; *galea* subito inversa, extus depresse convexa, intus appendiculis longioribus teretibus dense echinata, his plerumque staminiferis, supremis longioribus et sterilibus; *stamina* iis *Bertholletiæ* similia. *Ovarium* inferum, semiglobusum, vel turbinatum, vertice intra discum planum convexo, 4- raro 5-loculare; *ovula* in quoque loculo plurima, a placentis crassis centralibus funiculo distincto pluriseriatim suspensa, anatropa: *stylus* longiusculus, teres, subincurvus; *stigma* minimum, subglobosum, papillosum. *Pyxidium* sæpius maximum, ovale, turbinatum, vel globosum, ad varias altitudines *zona calycari* e sepalis incrassatis plus minusve tumidis cinctum; *vitta interzonali* modo vario elevata; *zona superiore* orbiculari, et hinc dehiscente; *operculum* majusculum, subcirculare, crassissimum, ligneum, vel fibroso-coriaceum, supra convexum, sæpe umbonatum, subtus ad *columellam* longe descendentem 4-angulatam arcte agglutinatum, et simul deciduum: *pericarpium* crassum, ligneum, durum, 4- vel incomplete 5-loculare: *semina* in quoque loculo 4–6, oblonga, utrinque obtusa, fusca, longitudinaliter costato-sulcata, ab hilo subsupero funiculo (seu strophiola) albo carnoso fere æquimagno suspensa; *testa* crassa, dura, sublignosa, et *raphes* ramis intra costas sepultis munita; *integumentum internum* tenuiter membranaceum, *chalaza* infera sæpe signatum: *embryo* exalbuminosus, edulis, albus, amygdalinus, utrinque obtusus, homogeneus, seu re vera *radicula* gigantea, cujus *exorhiza* externa *neorhizam* internam distincte et undique cingit, *cotyledonibus* 4, minutissimis, decussatim imbricatis, valde depressis, vix distinctis, ab hilo remotis, cum *plumula* obtusa sub iis abscondita, ita ut in germinatione plumula per cotyledones propulsa novæ plantæ *cauliculum* squamigerum gignat, et neorhizæ incremento *radicella*, e mamilla hilo proxima, erumpat.

Arbores *Americæ tropicæ et Antillanæ sæpius maximæ*, trunco *crasso, dure ligneo*, cortice *coriaceo*, libero, *e laminis numerosissimis solubilibus confecto, ramosæ*: folia *elliptica, vel oblonga, raro cordata, sæpius glabra, integra vel serrata, petiolata*; paniculæ aut racemi *axillares et terminales, pluriflori*: flores *pedicellati, albi, rosei, aut lutei.*

1. Lecythis ollaria, Lœfl. Itin. p. 159; Linn. Sp. p. 734; DC. Prodr. iii. 291 (excl. syn.); Berg in Mart. Flor. Bras. *l. c.* p. 615; in Linn. xxvii. 449: arbor vasta; ramulis verruculosis; foliis ovatis, imo cordatis, apice obtusis, subserratis, firme chartaceis, subundulatis, supra fusco-viridibus, petiolo subnullo: racemo terminali, spicato, rachi angulata; pedicellis e nodis alternis, horizontalibus, bractea ovata decidua munitis; floribus nutantibus; sepalis 6, oblongis, inæqualibus, exterioribus rotundioribus, concavis, persistentibus; petalis 6, multo majoribus, patulis, subinæqualibus, oblongis, vel subrotundatis, concavis, marginibus oblique reflexis, albis; androphoro luteo: ovario infero, 4-loculari, vertice depresso; stylo subbrevi; stigmate obtuso: pyxidio magno, imo subrotundo, supra medium zona calycari subannulari obtuse 6-lobata cincto; zona superiore integra; pericarpio lignoso. In Venezuela ad Barcelona (*Lœfling*); in Cumaná? *Humboldt* (sec. cl. *Berg*): *non vidi.*

We know nothing more of this species, that can be depended upon, beyond the above details, quoted from Lœfling; the few additional characters offered by Berg are here

omitted, because he obtained them from a specimen collected by Humboldt in Cumaná, now in the Berlin herbarium, and which has no flower; it is certainly doubtful whether that specimen is identical with Lœfling's plant, because the characters assigned to it by Berg apply equally to his *Lecythis cordata*, from Barcelona, which, in like manner, has sessile cordate leaves of similar shape. Indeed this latter plant might have been considered identical with *L. ollaria*, were it not for the structure of the ovary, which is said by Berg to be 2-locular, with a shortish style, and which, therefore, must be referred to the genus *Eschweilera*. We know of another Venezuelan species with cordate leaves (from Tovar), *L. tenax*, Berg, which, for a similar reason, is also an *Eschweilera*, as I have verified.

Linnæus never saw the plant; nor does it appear that any botanist since the time of Lœfling (1758) has met with it, if we except the doubtful instance of Humboldt.

2. Lecythis ampullaria, nob.: planta ignota: pyxidio maximo, vasiformi, oblongo-ovato, medio sensim ventricoso, et 12-sulcato, zona calycari paullo supra medium lineari cincto; vitta interzonali conica, diametri dimidia parte alta, incurvata, infra summum subito expansa, labium prominens simulante; zona superiore circulari, integra, fauce intus in labrum latissimum nitens producto; operculo ignoto; pericarpio crasso, leviter lignoso; seminibus magnis, elongato-oblongis, utrinque obtusis, pallide brunneis, cum costis prominentibus circa 7, intervallis angulatis et transversim corrugulatis. In Nova Granada: *v. fr. s. in Mus. Kew.*, Nova Granada (*Triana*); Antioquia (*Jarvis*).

Whether these fruits belong to *L. integrifolia*, R. & P., or some other species from the same locality, we have no evidence to determine. The two specimens in the Kew Museum have evidently been used as water-bottles, their bottoms being truncately cut to enable them to stand upright. Their thin bark has been smoothed off, leaving a fibrous surface, with twelve longitudinal furrows, which cease at a transverse line which I take to be the calycary zone. The larger specimen (Plate XXXVIII.) is $8\frac{1}{2}$ in. long, $6\frac{1}{4}$ in. broad at the ventricose middle, $5\frac{1}{2}$ in. at the calycary zone, which is $2\frac{3}{4}$ in. below the upper zone; the interzonary band is contracted below the lip-shaped mouth to a diameter of 4 inches; the upper zone is 5 in. in diam., with a rather obtuse margin; and this inclines inward to form the lip, which has an enamelled surface $1\frac{1}{4}$ in. broad, where it narrows gradually into a contracted mouth 3 in. in diam.; the pericarp is $\frac{1}{2}$ in. thick at the interzonal band, $\frac{5}{8}$ in. in the middle, and much thicker at the base; the inner space is $7\frac{3}{4}$ in. deep, 5 in. wide in the middle; the seeds are 3 in. long, 1 in. broad, rather narrower at base, and marked near one extremity with a lateral hilum. The smaller specimen, from Antioquia, is only half the size of the above, and is probably only half-grown; its surface has been scraped off in a similar manner.

3. Lecythis Amazonum, Mart., Berg in Mart. Fl. Bras. *l. c.* p. 484, tab. 66, 67: planta ignota: pyxidio maximo, late oviformi, imo hemisphærice rotundato, longe supra medium zona calycari obsolete 6-lobata vix prominente cincto; vitta interzonali

convexiuscula, conice inclinata, diametri circa quintam partem alta; zona superiore quam inferiore multo angustiore, integra, circulari; operculo vittæ altitudine, sphærice convexo, solido, subtus columella intra faucem valde incrassata hinc obconica, profunde 4-sulcata et longe descendente aucto; pericarpio crassissimo, subspongiose lignoso, subleviter opaco, vel granulis parvis elevatis subirrorato, obsolete 4-loculari. In Brasilia, prov. Parà (*Martius*): *non vidi*

This species, seen by Von Martius, was a tree too lofty to obtain a specimen of its leaves or inflorescence. The pyxidium is 9 in. long, $7\frac{1}{2}$ in. broad in the middle; the calycary zone is $6\frac{3}{4}$ in. above the base, 6 in. in diam.; the interzonary band is 1 in. high; the superior zone and operculum $3\frac{3}{4}$ in. in diam., height of the latter $1\frac{1}{4}$ in., the columella filling the mouth and descending to the depth of 4 in.; pericarp $\frac{3}{4}$ in. thick, its inner mouth 3 in. broad, depth of cell below upper zone $7\frac{1}{2}$ in., its internal diameter $6\frac{1}{2}$ in.; seeds 1 in. long, 8 lines broad.

4. Lecythis urnigera, Mart., Berg in Mart. Flor. Bras. *l. c.* p. 493, tab. 64: ramulis rugosis, subgriseis, opacis, subsulcatis; foliis ovalibus, imo rotundatis, apice sæpissime obtusatis, ad marginem subtenuem flavescentem serrulatis, dentibus obtusis, subchartaceis, supra viridibus, opacis, nervis tenuissimis patentim divaricatis vix prominulis, creberrime reticulatis, subtus pallidioribus, nervis venisque prominulis, costa prominente; petiolo tenui, supra sulcato et marginato, subtus fusciore, limbo 10plo breviore: inflorescentia brevi (invisa); pedicellis fructiferis valde incrassatis: pyxidio maximo, ovali-oblongo, infra vel ad medium subventricoso, longe supra medium zona calycari vix prominula annulari circumdato, margine acutiusculo erecta, undulata et obsolete 6-loba, ambitu circulari; vitta interzonali imo coarctata et anguste canaliculata, dein conice convexa, diametri quartam partem alta; zona superiore integra, inferiore angustiore, fauce crassissima, introrsum inclinata, ore zona dimidio minore; operculo rotundiuscule et conice convexo, vitta duplo altiore, solido, subtus columella aucto, hac primum valde crassa, faucem implente, dein subbreviter obconica, 4-sulcata; pericarpio crassissimo, subscabride granuloso vel scrobiculato-rugoso, granulis flavidis creberrime signato, interdum sublacunose tuberculato, obsolete 4-loculari; seminibus 16–24, ovato-oblongis, profunde sulcatis, costis furcatis, funiculo magno carnoso suspensis. In Brasilia, prov. Rio Janeiro (Cantagallo): *v. pl. s. in herb. meo*, Marica (*Mattos*); *v. fr. s.* ex eodem loc. (*Mattos*), *in Mus. Fry. et meo*, Novo Friburgo (*Cox*); Ilheos (*Hawkshaw*).

Specimens of the plant, without flowers, but attached to the fruit, were lately received from Sen. Mattos; I also obtained the fruit in a fresh state many years ago in Rio de Janeiro. The species forms a tree of immense size, unquestionably the same as *L. urnigera*, Mart., which extends over the province from Maricá to Cantagallo, and even as far north as Ilheos. The leaves are 3–$3\frac{1}{4}$ in. long, 2–$2\frac{1}{8}$ in. broad, on a petiole $3\frac{1}{2}$–4 lines long; and they have about 15 pairs of nerves, with others shorter and intermediate, all anastomosing. The pyxidium (Plate XXXIX.) is 7–$10\frac{1}{2}$ in. long, 6–$7\frac{1}{2}$ in. broad; the calycary zone $5\frac{1}{4}$–$6\frac{1}{4}$ in. in diam., 5–$7\frac{1}{4}$ in. above the base; the interzonary band is 1–$1\frac{1}{8}$ in.

high; the upper zone is circular $3\frac{1}{4}$–$4\frac{1}{4}$ in. in diam., the inner mouth contracted and slanting downward to a diameter of $1\frac{1}{2}$–2 in.; the operculum is $3\frac{1}{4}$–$4\frac{1}{4}$ in. in diam., $1\frac{1}{2}$–2 in. high, solid, with the attached columella, at first $1\frac{1}{4}$ in. thick, $2\frac{1}{2}$ long, extending downwards to an obtuse point; the pericarp is nearly 1 in. thick, depth of inner space from upper zone 5–7 in., the internal diam. 4–6 in.; the seeds are $1\frac{3}{4}$–2 in. long, 1–$1\frac{1}{8}$ in. broad, suspended by white fleshy funicles of nearly the same length; the fruit is borne upon a long, thick, woody support. This pyxidium resembles that of *L. Amazonum* in size, but is more elongated, with a longer operculum, a shorter columella, and a more contracted mouth, and larger seeds. The larger dimensions above given are those of Berg, the smaller ones from some of my own specimens. The leaves were not seen by Berg.

It is distinguished from *L. Velloziana* by its shorter axils, more ovate leaves, not acuminated, more finely serrated, by its more robust pyxidium, more rounded at the base, of a paler yellowish colour, lighter consistence, with a smoother subgranular surface, by its lobeless annular calycary zone, showing inside of it a deep circular channel.

5. Lecythis Velloziana, nob: *Lecythis ollaria*, Vell., non Linn., Fl. Flum. p. 222, Icon. v. tab. 88: foliis ellipticis, imo in petiolum sensim subacutis, apice gradatim acute attenuatis, subgrossule serratis, petiolo limbo 12plo breviore: floribus ignotis: pyxidio magno, late ovato, vasiformi-cylindrico, imo valde rotundato, medio sensim paullo constricto, supra medium zona calycari subannulata, obsolete 6-lobata, ambitu subhexagona, margine sursum spectante cincto; vitta interzonali subconica, apice rotundiore, diametri tertiam partem alta; zona superiore orbiculari, inferiore multo minore; operculo convexo, vittæ fere altitudine, solido, columella crassissima imo obconica et 4-sulcat a aucto; pericarpio crassissimo, subponderoso, luride brunneo, opaco, granulatim irrorato, obsolete 4-loculari. In Brasilia, prov. Rio de Janeiro: *v. fruct. in Mus. Fry.*; *pl. non vidi.*

The axils of its branchlets are about $1\frac{1}{4}$ in. apart; the leaves are 3–$3\frac{3}{4}$ in. long, $1\frac{1}{2}$–$1\frac{3}{4}$ in. broad, on a petiole 3 lines long; the pyxidium (Plate XL.) is $8\frac{1}{2}$ in. long, $6\frac{1}{2}$ in. broad; the calycary zone, $5\frac{1}{2}$ in. above the base, is $6\frac{3}{8}$ in. in diam.; the interzonary band is $1\frac{3}{4}$ in. high; the upper zone and operculum 4 in. in diam.; the latter, $1\frac{1}{8}$ in. high, is thickened beneath by the portion filling the mouth, $\frac{5}{8}$ in. deep, and further lengthened $1\frac{1}{2}$ in. by the descending obconical portion of the columella; pericarp $\frac{3}{4}$–$\frac{7}{8}$ in. thick; depth of inner space below the upper zone $5\frac{3}{4}$ in., internal diameter $4\frac{3}{4}$ in., the contracted aperture of the mouth being $2\frac{1}{2}$ in. broad; the seeds are $2\frac{1}{2}$ in. long, 1 in. broad, contracted at each extremity.

The species differs from *L. urnigera* in the more elliptic shape of its leaves, its more ascending nerves, and a very different pyxidium.

6. Lecythis Bogotensis, nob.: planta ignota: pyxidio magno, vasiformi, cylindrico, imo sensim breviter rotundato, longe supra medium zona calycari ambitu annulari paullo prominente undulatim 6-loba cincto, lobis subrotundis, compressis, erectis; vitta interzonali circa lobos concava, dein introrsum convexe accliva, dia-

metri quintam partem alta; zona superiore integra, quam inferiore multo angustiore; operculo pulvinato, valde depresso, centro paullo convexo, subtus columella fibroso-spongiosa intra faucem crassissima dein obconica et 4-sulcata aucto; pericarpio crasso, fibroso-lignoso, cortice tenuissimo pallide brunneo pruinose opaco minute granulato tecto, obsolete 4-loculari. In Nova Granada: *v. fr. sicc. in Mus. Brit.*, Bogota.

This is very distinct from all others of Peruvian origin. The pyxidium (Plate XLI.) is remarkable for its size, shape, lightness of texture, and flattened operculum; it is $8\frac{1}{2}$ in. long, $6\frac{1}{2}$ in. broad; the calycary zone, 7 in. from the base, is 7 in. in diam.; the interzonary band is 1 in. high; the upper zone and operculum are 4 in. in diam., the latter only $\frac{1}{2}$ in. high, the fibrous base of the attached columella, within the mouth, being $\frac{1}{8}$ in. thick.

7. Lecythis vasiformis, nob.: planta ignota: pyxidio vasiformi, infra medium turbinato, imum versus constricto, truncato, et umbilicato, medio late cylindrico, longe supra medium zona calycari annulari ambitu circulari subacuta aut obtusa prominente obsolete lobata cincto; vitta interzonali subdepressa, paullo convexa, diametri 6–10mam partem alta; zona superiore integra, inferiore multo angustiore; operculo depresse convexo, late et obtuse umbonato, inferne columella valde incrassata primum truncata dein obconica et 4-sulcata aucto; pericarpio crassissimo, levissime lignoso, brunneo, areolis irregularibus paullo impressis variolato, obsolete 4-loculari, operculo extus tuberculato-rugoso; seminibus pluribus, late oblongis, obtusis, irregulariter costatis, costis furcatis paullo prominulis, brunneis, glauco-opacis, minute granulatis. In Brasilia, prov. Rio de Janeiro: *v. s. in Mus. Fry.*

Of this species, remarkable for the extreme lightness of its pyxidium (Plate XLII. fig. 1), I have seen two specimens; they are 7 in. long; the calycary zone $5\frac{1}{4}$–$5\frac{3}{4}$ in. from the base, $6\frac{3}{4}$–7 in. in diam; the broad, much inclined interzonal band is 1–$1\frac{1}{4}$ in. high, the upper zone and operculum $3\frac{1}{4}$–$3\frac{1}{2}$ in. in diam., the latter $\frac{1}{2}$–$\frac{3}{4}$ in. high, expanded below by the extremely incrassated base of the columella, of nearly its diameter, and perpendicular; there it is 1–$1\frac{1}{2}$ in. in thickness, where it fills the mouth, thence narrowing into a short obtuse 4-sulcated cone, making it altogether $1\frac{1}{2}$ in. long; the pericarp is nearly 1 in. thick; the internal space below the upper zone is $4\frac{3}{4}$ in. deep, 4–$4\frac{1}{2}$ in. in diam.; the seeds $1\frac{3}{4}$ in. long, $1\frac{1}{8}$ in. broad.

8. Lecythis ampla, nob.: planta ignota: pyxidio majusculo, urniformi, cylindrico, imo hemisphærice rotundato, supra medium zona calycari undulatim 6-lobata margine acute brevissimo sursum spectante cincto; vitta interzonali primum subconcava, dein adscendente, sensim erecta, diametri dimidii altitudine; zona superiore quam inferiore multo minore, integra; operculo vittæ fere altitudine, primum convexo et pulvinato, dein late umbonato, solido, subtus columella basi crassissima tunc longe obconica et 4-sulcata aucto; pericarpio crasso, pallide brunneo, opaco, cortice tenui subrimoso, lenticellis flavidis granuloso; seminibus oblongis, utrinque obtusis,

fusco-brunneis, glauco-pruinosis, irregulariter costatis, costis paullo prominentibus. In Nova Granada: *v. fr. sicc. in Mus. Kew.*, Antioquia (*Jervis*).

The fruit (Plate XLIII. fig. 1) is extremely different from *L. ampullaria* from the same locality. The pyxidium is $8\frac{1}{2}$ in. long, $5\frac{7}{8}$ in. broad; calycary zone $5\frac{1}{8}$ in. above the base, 6 in. in diam.; interzonary band $1\frac{3}{4}$ in. high; operculum $3\frac{3}{4}$ in. in diam., $1\frac{3}{4}$ in. high; columella, with a neck filling the mouth 9 lines thick, is altogether 4 in. long; pericarp $\frac{5}{8}$ in. thick, internally 6 in. deep from upper zone, and $4\frac{1}{2}$ in. broad; it is covered by a rather thin cracking bark, granulated with raised hollow lenticels; the seeds are $1\frac{3}{4}$ in. long, 1 in. broad.

9. Lecythis validissima, nob.: planta ignota: pyxidio late vasiformi, imo rotundato, supra medium zona calycari annulatim prominula et obsolete 6-lobata margine erecta cincto; vitta interzonali primum concava, dein conice convexa, diametri 7mam partem alta; zona superiore circulari, inferiore minore; operculo altiore, pulvinato, valde crasso, subtus columella descendente aucto, hac orificium implente, dein anguste obconica et 4-sulcata; pericarpio crassissimo, lignoso, ponderoso, brunneo, granulatim scrobiculato, obsolete 4-loculari; seminibus oblongis, obtusulis, opace brunneis, subgranulatis, costis rubellis prominulis irregulariter furcatis. In Guiana: *v. s. in Mus. Brit.*, sine loco et forsan indigena; *in Mus. Kew.*, ins. Mauritiana cult. (*J. Duncan*).

The former specimen (Plate XLIV.) agrees in size, shape, and other respects with the latter, which is cultivated in the Mauritius, and is one of the three kinds transported from Cayenne in 1760, by order of the French government (the other two species being *L. lanceolata* and *L. Zabucayo*). It much resembles the latter in form, but is much larger, and of much heavier consistence. It is $7\frac{1}{2}$–$7\frac{3}{4}$ in. long, $5\frac{3}{4}$–$6\frac{1}{4}$ in. broad; the calycary zone is $6\frac{1}{4}$–$6\frac{1}{2}$ in. in diam., and 6 in. above the base; the interzonary band is 1 in. high; the upper zone and operculum are $4\frac{1}{4}$–$4\frac{1}{2}$ in. broad, the latter $1\frac{3}{4}$ in. high, thickened beneath by the columella, which fills the mouth, where it is $\frac{1}{2}$ in. thick, and is expanded below in a 4-grooved conical form, reaching the middle of the cell; the pericarp in the Guiana specimen is $\frac{7}{8}$ in., in that from the Mauritius 1 in. thick.

10. Lecythis lacunosa, nob.: planta ignota: pyxidio urniformi, imo sensim angustiore: 6-sulcato et umbilicato, medio subventricoso, longe supra medium zona calycari annulatim prominente obsolete 6-loba ambitu circulari cincto, lobis late rotundatis, brevissimis, erectis, vel paullo inflexis, compressis; vitta interzonali valde depressa, primum concava, dein convexiuscula, paullo elevata, vel interdum subter zonam demissa et horizontaliter depressa; zona superiore integra, circulari, inferiore multo minore; operculo convexo, tuberculato, rugoso, subtus columella brevi, intra faucem incrassata subtruncata cavernis 4 insculpta dein subito brevissime obconica et 4-sulcata aucto; pericarpio ecorticato, subcrasso, glauco-brunneo, scrobiculato, vel tuberculato, cum areolis impressis et foveolis profundis variolato (vitta operculoque tuberculato-rugosis et foveolatis), sub- 4-loculari; seminibus 24, majusculis, obtuse oblongis, castaneis, costis crassis irregulariter furcatis prominentibus, sub-

nitidis, obsolete rugulosis. In Brasilia: *v. s. in Mus. Brit.* (*Capt. Burton*): exempla 2 *in Mus. Kew.* e Brasilia (sine nomine): *in Mus. Fry. et meo*, Rio de Janeiro.

The specimens vary in size, though all possess similar characters, one being remarkable for its nearly horizontal interzonary band sunk almost below the level of the calycary zone. Burton's larger specimen (Plate XLV.) is $7\frac{1}{4}$ in. long, $5\frac{3}{4}$ in. broad; the calycary zone, 6 in. above the base, is $\frac{1}{2}$ in. broader; the interzonary band is $\frac{1}{2}$ in. high, (in the second specimen $\frac{3}{4}$ in., in the third $\frac{1}{2}$ in. above the top of the zone); the upper zone and operculum are $3\frac{1}{4}$ in. broad, the latter $\frac{3}{4}$ in. high; that portion of the columella which fills the mouth is $\frac{3}{4}$ in. thick, and is further extended into a short 4-grooved cone of about the same length; the pericarp is $\frac{5}{8}$ in. thick; the seeds $1\frac{1}{2}$–2 in. long, 1–$1\frac{1}{8}$ in. broad.

In my own specimen the calycary zone is 5 in. in diameter and $4\frac{1}{2}$ in. above the subhemisphærical base, the interzonary band is $\frac{1}{2}$ in. higher; the upper zone $3\frac{3}{4}$ in. in diam., with its mouth inflexed and 3 in. in diam.; the pericarp is $\frac{3}{4}$ in. thick, the depth inside below the upper zone is 3 in.; the operculum is 3 in. broad, 1 in. high; the descending truncated portion is 1 in. long, and deeply 4-channelled.

11. Lecythis lanceolata, Poir. (non Berg), Encyc. Méth. vi. 27; DC. Prodr. iii. 291: ramulis tenuiter virgatis, teretibus, brunneis, substriatis, lenticellatis; foliis oblongis vel lanceolatis, imo subobtusis et in petiolo decurrentibus, apice longiuscule sensim acuminatis, creberrime serrulatis, submembranaceis, supra læte viridibus, sublucentibus, planis, nervis tenuibus venisque creberrime reticulatis prominulis, subtus paululo pallidioribus, subopacis, costa tenui, sulcata, prominente, nervis prominulis; petiolo tenuissimo, canaliculato, subtus ruguloso, limbo 10plo breviore: racemis axillaribus, folio subæquilongis, rachi tenui, angulata, pruinosa, sub-10-flora; sepalis 6, pedicello paullo longioribus, acute ovatis, extus pruinosis, marginibus membranaceis, ciliatis; petalis 6, ovatis; stylo brevi; stigmate parvo, 4-lobo; ovario infero, parvo, 4-loculari, vertice plano, radiatim striato: pyxidio majusculo, oblongo-ovato, imo rotundato, medio subcylindrico, supra medium zona calycari paullo prominente annulari obsolete 6-lobata cincto, lobis brevibus, rotundatis, erectis, margine sursum acutiusculis; vitta interzonali primum concava, dein acclivi, diametri quintam partem alta; zona superiore integra, inferiore minore; operculo pulvinatim convexo, vitta 2–3plo altiore, subtus columella conica longe descendente 4-sulcata aucto; pericarpio crasso, sublignoso, subponderoso, cortice tenui, brunneo, crebrigranoso, subtus impresse areolato, areolis albide granulosis, obsolete 4-loculari; seminibus circ. 12, oblongo-ovatis, utrinque obtusatis, fuscis, furcatim late costatis. In Guiana incola et in insulis Mauritianis culta: *v. pl. siccam in herb. Soc. Linn.* (*Smith*), Isle of France (*Commerson ex herb. Thouars.*, no. 382): *v. fr. sic. in Mus. Brit.*, Guiana (sine nomine); Bourbon (sine nom.): *in Mus. Kew.* Mauritius (*Duncan*); altera sine nomine (forsan indigena).

This is one of the species transported in 1770, by order of the French Government, to the Mauritius, where it still flourishes. It is a lofty tree: the axils of its virgate branchlets are $\frac{3}{4}$–1 in. apart; its bright green thin leaves are $2\frac{1}{2}$–$3\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in.

broad, on a petiole 3–4 lines long; the rachis of the raceme is 2–2$\frac{3}{4}$ in. long; the pedicels are 1$\frac{1}{2}$ line long; the flower in bud is $\frac{1}{2}$ in. in diam., the sepals 1$\frac{1}{2}$ line long. The pyxidium (Plate XLVI.) is 5$\frac{3}{4}$ in. long, 4$\frac{1}{2}$ in. in diam.; the calycary zone 4 in. above the base; the interzonal band is $\frac{3}{4}$ in. high; the operculum is 3$\frac{1}{2}$ in. in diam., 1$\frac{1}{4}$ in. high, the columella attached beneath it, being there 3$\frac{1}{2}$ in. broad, 2$\frac{3}{4}$ in. long, conical, 4-angled, with 4 deep hollows; the pericarp is $\frac{3}{4}$ in. thick; the depth of the cell is 3$\frac{1}{2}$ in., its internal diam. 3 in., the inner mouth under the operculum being 2 in. in diam. In Duncan's specimen the thin granulated bark is partly scraped away, showing beneath it many impressed whitish areoles. The indigenous specimen in the Kew Museum is rather wider, and the operculum broader and of more fibrous consistence. The specimen in the British Museum, from the Island of Bourbon, is smaller and immature; its operculum is taller and more pulvinate, and contains 12 immature seeds only 14 lines long.

Dr. Berg (Fl. Bras. *l. c.* p. 482) confounded this Guiana species, which he had not seen, with Velloz's *Lecythis minor* from Rio de Janeiro, a species well known by me, and to be presently described under *Lecythis tuberculata*.

12. Lecythis Zabucayo, Aubl. Guian. ii. 718, tab. 288 (excl. syn.); DC. Prodr. iii. 293; Berg in Linn. xxvii. 453: ramulis subteretibus, subangulato-striatis, ad axillas compressis, fusco-brunneis, lenticellis flavis creberrime verruculosis, junioribus tenuioribus, lævibus; foliis oblongis, vel lanceolato-oblongis, imo obtusis aut acutioribus, apice repentino longiuscule et acute attenuatis, subintegris, vel obsolete crenulato-serratis, chartaceis, supra pallide viridibus, subopacis, nervis tenuibus subpatentibus vix prominulis, reticulatis, costa tenui prominula, subtus fulvis, opacis, minute granulosis, nervis venisque prominentibus, costa flava, striolata, prominente; petiolo fusculo, supra plano, marginato, subtus ruguloso, limbo 24plo breviore: racemis axillaribus et terminalibus, folio multo brevioribus, paucifloris; rachi flexuosa, pruinosa, crebre nodosa; floribus mediocribus, pallidis, glutinosis; pedicello subangulato, sepalis breviore; sepalis pallidis, crassiusculis, ovato-acutis, subcarinatis, opacis, imo gibbosis, marginibus anguste membranaceis, erosulis; petalis ovatis, albis; androphoro roseo; ovario infero, turbinato, vertice subconcavo, 4-loculari, ovulis plurimis paullo sub apice axi affixis, radiantibus: pyxidio late ovato, imo truncatim rotundato, medio cylindrico, supra medium zona calycari vix prominente obsolete 6-loba cincto, lobis late obtusis, sursum incurvulis et acutiusculis; vitta interzonali primum concava dein conice convexa, diametri 3–4tam partem alta; zona superiore circulari, inferiore angustiore; operculo depresse convexo, subtus columella faucem implente crassissima aucto, hac obconica, 4-sulcata, longe descendente; pericarpio crassissimo, pallide brunneo, minute granuloso, leviter ponderoso. In Guiana, *v. s. plant.* (specim. typic.) *in herb. Mus. Brit.*, Cayenne (*Aublet*); Guiana (*Martin*): *v. s. fruct. in Mus. Kew.* sine loco (*Booth*).

A tree 60 feet high, with spreading branches; the axils of the branchlets are 1–1$\frac{1}{2}$ in. apart: the leaves are 6$\frac{1}{4}$–7$\frac{3}{4}$ in. long, 2–3 in. broad, on a petiole 3–5 lines long; they have about 12 or 15 pairs of nerves, with others shorter and intermediate: the rachis of its simple raceme is 2–3 in. long, when panicular 5 in. long, with branches 1–1$\frac{1}{2}$ in. long.

The specimen of the fruit at Kew (Plate XLVII.), without locality, agrees with the dimensions given by Aublet, and another in the British Museum, which differs only in having the operculum somewhat higher; they are all $6\frac{1}{4}$ in. long, about 5 in. broad; the calycary zone is $4\frac{1}{4}$–$4\frac{3}{4}$ in. above the base and 5 in. in diam.; the interzonary band is $\frac{7}{8}$–1 in. high; the upper zone and operculum $3\frac{1}{8}$–$3\frac{7}{8}$ in. broad, the latter $\frac{7}{8}$–$1\frac{1}{4}$ in. high; the columella in the mouth is extremely thick, descending in a long 4-sulcated cone.

It must be understood that this species is not indigenous in the Mauritius. It appears that the Comte d'Estaing, during a visit to Cayenne in 1758, was so much delighted with the seeds of the Zabucaya, that he carried away with him twelve living plants of the tree, which he conveyed to the Mauritius, planting them in the garden of Réduit. Aublet saw them there in a flourishing condition in 1762, when he returned to France; but he feared they perished soon afterward through neglect. M. Poivre, the botanist, arrived at Port Louis in 1761, as intendant of the colony; and in 1768 he founded the Botanic Garden at Pamplemousses, and applied to the French government to have fresh plants transported from Cayenne: these afterwards arrived in good condition, and were planted there and in the Isle Bourbon, and would seem to be still flourishing there. We can therefore account for the presence in the Kew Museum of the fruits of 3 species sent from the Mauritius, viz. *L. Zabucayo*, *L. lanceolata*, and *L. validissima*, all derived originally from Cayenne.

13. Lecythis usitata, nob.: *Lecythis ollaria*, Spruce (non Linn.), Hook. Kew Jo. ii. 74: *Lecythis Zabucayo*, Hook. (non Aubl.), *l. c.* i. 21: ramulis brunneis, subtenuibus, teretibus, rugoso-striatis, lenticellis verruculosis; foliis ellipticis, imo rotundiusculis, ibi canaliculatis et in petiolum breviter acutatis, apice in acumen subbreve mucronulatum subrecurvulum subito attenuatis, marginibus vix revolutis serrulatis, tenuiter chartaceis, supra profunde viridibus, subnitidis, nervis tenuibus patentim divaricatis paullo prominulis, costa prominula, striata, sub lente minute granulatis, subtus pallidioribus, brunnescentibus, glauco-opacis, nervis venisque prominulis, costa prominente; petiolo subtenui, supra plano, subtus corruguloso, limbo 12plo breviore: racemis axillaribus et terminalibus, folio multo brevioribus, rachi flexuosa, nodosa (flores desunt): pyxidio globoso-ovato, imo ovali, ad medium zona calycari paullo prominente ambitu circulari obsolete lobata cincto; vitta interzonali sensim conice subconvexa, diametri tertiam partem alta; zona superiore integra, inferiore dimidio angustiore; operculo ignoto; pericarpio crasso, subponderoso, opacissimo, cortice tenui ochraceo-brunneo in areolis rimoso; seminibus plurimis, majusculis, oblongis, utrinque subacutis, irregulariter costatis, cum rugis transversis in intervallis, grate edulibus. In Brasilia, prov. Para, inde abundat: *v. pl. s. in herb. Hook.*, ins. Caripé (*Spruce*, 23): *v. fr. s. in Mus. Kew.*, Caripé (*Spruce*); Brasilia (*Wetheral*).

This is the species which produces the well-known Sapucayo nuts of commerce, and is very different from the *Lecythis Zapucayo* of Aublet: it abounds in the island of Caripe and other parts of the province of Pará, and is mentioned by Spruce in the list of his

contributions to the Kew Museum (Hook. Kew Jo. ii. 74, no. 23). The axils of its branches are 4–8 lines apart; the leaves are $3\frac{1}{2}$–$5\frac{1}{4}$ in. long, $1\frac{1}{8}$–2 in. broad, on a petiole $2\frac{1}{2}$–3 lines long; they have about 12 pairs or more of nerves, with others shorter and intermediate, all anastomosing. The raceme is $1\frac{1}{2}$–3 in. long, the nodes of the rachis 2–3 lines apart, supporting a pedicel 1 line long; the sepals are 2 lines, the petals 15 lines long, and 9 lines broad. The pyxidium (Plate XLVII. fig. 2) is $4\frac{3}{4}$ in. long, $5\frac{5}{8}$ in. broad at the calycary zone, which is $2\frac{3}{4}$ in. above the base; the interzonary band is $1\frac{3}{4}$ in. high; the upper zone $3\frac{5}{8}$ in. in diam., the operculum being lost in both specimens; the mouth is $\frac{5}{8}$ in. deep, and contracted to a diameter of $2\frac{1}{2}$–$2\frac{3}{4}$ in.; the pericarp is $\frac{3}{4}$ in. thick, the depth of the internal space is $3\frac{3}{4}$ in. below the upper zone, and its internal diam. is $3\frac{1}{2}$ in.; the seeds are 2 in. long, 1 in. broad. There are 2 specimens in the Kew Museum, one sent by Dr. Spruce, the other by Mr. Wetheral, who contributed many vegetable productions from the Amazonas region.

14. Lecythis Pohlii, Berg, in Mart. Fl. Br. *l. c.* p. 484, tab. 7. fig. 150 et tab. 68; Linn. xxvii. 452 (excl. syn.): ramis nigrescentibus, ramulis teneris, brunneis, minute verruculosis, subpruinosis; foliis ovato-oblongis, oblongis, vel oblongo-lanceolatis, imo rotundatis et in petiolum sæpe breviter acutatis, apice in acumen angustum longissimum acutum attenuatis, serrulatis, dentibus subminutis, tenuiter membranaceis, utrinque læte viridibus, supra nitidis, nervis tenuissimis, patentim divergentibus, prominulis, crebre reticulatis, costa tenuissima, subtus vix opacis, nervis prominulis, costa utrinque striolata; petiolo tenuissimo, marginato, limbo 30plo breviore: racemis (sec. cl. Berg) axillaribus, folio sæpius brevioribus; rachi gracili, pauciflora; floribus parvis; pedicellis sulcatis, minutissime puberulis, calycem æquantibus; sepalis obovatis, subpatentibus, pruinosis; petalis obovatis; ovario semiinfero, parvo, 4-loculari, vertice convexo, puberulo; stylo tereti: pyxidio subgloboso, imo rotundato; supra medium zona calycari obsolete 6-lobata ambitu circulari vix prominula cincto; vitta interzonali primum incurva, dein acclive convexa, diametri quartam partem alta; zona superiore circulari, inferiore paullo minore; operculo valido, vittæ dupla altitudine, sphærice convexo, subtus columella primum crassissima et truncata, mox obconica et 4-sulcata, longiuscule descendente aucto; pericarpio crassissimo, dure lignoso, griseo-fuscescente, obsolete scrobiculato, evanide 4-loculari; seminibus oblongis, utrinque obtusulis, irregulariter costatis, badiis. In Brasilia, prov. Goyaz, ad Pilar (*Pohl*, 4311): *v. pl. s. in hb. Hook.*, prov. Goyaz (*Burchell*, sine flore, 9865): *fr. non vidi.*

A species much resembling in habit *L. Pisonis*, but with a very different fruit, which are approaches in form that of *L. Marcgraaviana*. The axils of its slender branchlets $\frac{1}{2}$–$\frac{3}{4}$ in. apart; its extremely membranaceous leaves, with a long narrow acumen, are 2–5 in. long, 1–$1\frac{1}{2}$ in. broad, on a petiole 1–$1\frac{1}{2}$ line long; the axillary racemes are 1–2 in. long; the pedicels 1–2 lines long; the sepals 1 line, the petals 3–5 lines long in the bud, which is 3 lines in diam.; the pyxidium (Plate XLVIII. fig. 3, copied from Berg's figure) is 5 in. long, $4\frac{3}{4}$ in. broad; the calycary zone, with 6 obsoletely erect lobes, is 3 in. above the base, and equally broad; the interzonary band is 10 lines high; the

upper zone and close-fitting operculum are $3\frac{3}{8}$ in. in diam., the latter $1\frac{1}{4}$ in. high, its attached columella fills the much-thickened mouth (which is contracted to a breadth of $2\frac{1}{8}$ in.), and extends downwards for a length of 2 in.; the pericarp is $\frac{7}{8}$ in. thick, its internal diam. $3\frac{3}{4}$ in., its depth 3 in.; seeds $1\frac{3}{8}$ in. long, $\frac{3}{4}$ in. broad.

We find here another instance of the unfortunate guesses of Dr. Berg in respect to his synonyms: in the Flor. Bras. p. 482, he regarded the *L. minor* of Velloz (non Jacq.) as identical with his *L. lanceolata* (non Poir.): in his supplementary memoir in the Linnæa (vol. xxvii.) he abandoned that synonym, and applied it to his *L. Pohlii* (*l. c.* p. 452); but this latter is quite as unjustifiable as the former, as I have elsewhere shown.

15. Lecythis Marcgraaviana, nob.: *Jacapucaya Brasiliensis*, Marcg. Hist. Nat. Bras. (edit. 1648), p. 128: procerissima, trunco magno, cortice griseo, ligno duro; foliis rotundato-ovatis, imo cordatis, apice breviter acuminatis, grosse serratis, incurvatis, breviter petiolatis: pyxidio subgloboso, imo oblato-hemisphærico, supra medium zona calycari annulari prominente ambitu circulari margine acutiuscula sursum spectante et obsoletissime 6-loba cincto; vitta interzonali subito canaliculatim recessa, dein acclivi, diametri quartam partem alta; zona superiore circulari, integerrima, inferiore multo angustiore, fauce crassa et deorsum inclinatim contracta; operculo depresse convexo, vitta paullo demissiore, margine acutissimo ad zonam arcte applicito, subtus columella crassa aucto, hac primum crassa et faucem implente, dein descendente obconica et 4-sulcata; pericarpio crassissimo, dure lignoso, ponderoso, cortice tenui rimoso, opace brunneo, granuloso-ruguloso, obsolete 4-loculari; seminibus plurimis, ovato-oblongis, irregulariter sulcato-costatis, castaneo-brunneis, subpruinosis, interdum intra fructus germinantibus. In Brasilia, a Marcgraavio in Alagoas olim inventa: *v. fruct. sicc. in Mus. Soc. Linn.* ab eadem regione (*G. Don*).

The above fruit corresponds well with Marcgraaf's *Jacapucaya*; and I have no hesitation in affirming their identity. The pyxidium (Plate XLVIII. fig. 1) is $5\frac{3}{4}$ in. long, 6 in. in diam. below the calycary zone, and $6\frac{1}{4}$ in. across it, which is $3\frac{3}{4}$ in. above the base; the interzonary band is $1\frac{1}{8}$ in. high; the upper zone $3\frac{3}{4}$ in. in diam., the mouth $\frac{3}{4}$ in. thick, is contracted to a diameter of $2\frac{1}{4}$ in.; the operculum is 1 in. high, and its sharp margin fits so closely to the upper zone, that it is difficult to introduce the edge of a knife between them; it is thickened below by the body of the columella, which fills the mouth and descends in a conically 4-grooved form to the total depth of $2\frac{1}{2}$ in.; the pericarp is 1 in. thick, as dense as ironwood, the internal cavity (showing the vestiges of 4 dissepiments) is $3\frac{3}{4}$ in. deep and 4 in. in diam.; the seeds are $1\frac{1}{2}$ in. long, $\frac{7}{8}$ in. broad, the testa thick and hard, the nucleus white and edible. I found some of them beginning to sprout at both extremities.

Marcgraaf describes it as a very lofty tree, with a very hard timber, covered by a grey bark. It is probably the same which Gardner saw (Trav. p. 92), who describes an enormously large tree, the ground beneath it being covered with the fruits, the large coverlids of which had fallen off on the ripening of the seeds: most of them were

empty, the seeds having been devoured by the monkeys, who are very fond of them. The great height of the tree prevented him from obtaining specimens of it. He observed it in a forest near Catuca, twenty miles W. of Pernambuco and about sixty miles from Alagoas. Marcgraaf says the size and shape of the leaves are like those of the mulberry, and are therefore about $3\frac{1}{2}$ in. long and $2\frac{1}{4}$ in. broad.

16. Lecythis densa, nob.: planta ignota: pyxidio globoso-ovali, dense ponderoso, imo hemisphærico, fere ad medium zona calycari obtuse annulari vix lobata ambitu circulari cincto; vitta interzonali alte conica, diametri tertiam partem alta; zona superiore quam calycari dimidio minore, circulari, fauce crassa et declivi; operculo convexo, diametri tertiam partem alto; columella crassa faucem implente, subtus truncata et 4-cavernosa, dein in conum 4-sulcatum angustum longe descendentem constricta; pericarpio crassissimo, densissimo, ecorticato, fusco, crude tuberculato, impresse areolato, cum granulis interspersis. In Brasilia: *v. fr. s. in Mus. Brit.* (*Sloane*, 7798), loco ignoto.

This may possibly be the fruit of *L. ollaria*; it approaches *L. Pisonis* in its general character; the pyxidium (Plate XLIX. fig. 1) is $6\frac{3}{8}$ in. long, $5\frac{1}{2}$ in. from the upper zone to the base, $6\frac{1}{4}$ in. broad across the calycary zone, which is 3 in. above the base; the interzonary band is 2 in. high; the upper zone $3\frac{1}{8}$ in. across the mouth, which is $\frac{3}{4}$ in. deep, and contracted to a diameter of 2 in.; the operculum is $3\frac{1}{8}$ in. in diam., 1 in. high; the attached columella, $\frac{3}{4}$ in. thick, fills the mouth, and descends in a conical form to a further depth of 2 in.; the pericarp is $1\frac{1}{8}$ in. thick at the calycary zone, 1 in. thick above and at the base.

17. Lecythis Pisonis, Camb. Fl. Bras. ii. 377 (excl. synon.); Berg in Mart. Fl. Bras. *l. c.* p. 480, tab. 82 (excl. syn.); id. in Linnæa, xxvii. 499 (excl. syn.): arbor procera, trunco maximo, cortice quercino, crasso, irregulariter rimoso; ramulis gracilibus, pallide brunneis, pruinosis, striolatis, verruculosis; foliis oblongo- vel lanceolato-ellipticis, imo rotundiuscule obtusis, apice sensim angustioribus et in acumen acutum longiusculum constrictis, crebre et obtusule serrato-denticulatis, chartaceis, supra valde viridibus, subnitentibus, nervis tenuissimis stramineis arcuatim nexis, venis crebre reticulatis costaque tenui prominulis, subtus vix pallidioribus, opacioribus, costa fusca nervis stramineis venisque prominulis; petiolo fusco, canaliculato, marginato, subtus ruguloso, limbo 20–30plo breviore: racemis (sec. Camb.) folio brevioribus, rachi gracili, creberrime 5–10-flora; pedicellis calyci æquilongis; floribus majusculis; sepalis ovatis, obtusis, atro-violaceis, obsolete pruinosis; petalis obovatis, inæqualibus, violaceis, demum albidis, extus pruinosis; ovario subinfero, 4-loculari, ovulis plurimis ab axi radiantibus: pyxidio (sec. Berg, non Camb.) majusculo, imo hemisphærico, umbilicato et interdum 6-lobato, medium versus zona calycari annulari 6-nodata subprominente ambitu fere circulari cincto; vitta interzonali convexa, diametri plusquam dimidium alta; zona superiore quam calycari ad dimidium angustiore; fauce decliva, latiuscula, margine foveolis crebre 1-seriatis terebrata; operculo crasso, convexo, vittæ fere altitudine, subtus columella

aucto, hac primum crassa, faucem implente, subtus cavitatibus 4 infossata, et dein obconice descendente late 4-sulcata; pericarpio crassissimo, fere osseo, extus corrugulato et varioloso, obsolete 4-loculari; seminibus majusculis, oblongis, irregulariter costatis. In Brasilia, prov. Espiritu Santo et Minas Geraes ad ripas Rio Doce: *v. s. pl. sine flore in hb. Hook.* (*Burchell*, 9650, sine loco); *fructus* ab eadem regione *(non vidi)*.

I have no doubt of the identity of Burchell's flowerless specimen with that of St.-Hilaire, described by Cambessèdes, as it was through the same region that Burchell travelled on his way to the Rio Tocantins; its characters agree well with Cambessèdes' description, especially in its finely serrulated leaves, differing essentially from Berg's plant from Rio de Janeiro, the leaves of which are larger and crenately dentate. Berg's diagnosis of *L. Pisonis* (except that of the fruit) must therefore be rejected, as it appears to me well adapted to *L. Velloziana*, nob. (*L. ollaria*, Vell. non Linn.) I have accepted Berg's character of the fruit from Xipote, as it comes from the same region as St.-Hilaire's plant, near the source of the Rio Doce. On the other hand Cambassèdes' account of the fruit cannot be received, as he did not see it, and wrongly assumed it to be identical with the *Jacapucaya* of Marcgraaf, from Alagoas.

In Burchell's specimen, the axils of the slender branches are 1–1½ in. apart: the leaves are 2½–5½ in. long, 1½–2 in. broad, on petioles 1–2 lines long; they have about 18 pairs of slender nerves, with others shorter and intermediate. The raceme, according to Cambessèdes, is 3–4 in. long, the pedicels 2–3 lines long, the sepals 2–2½ lines long, the petals 9 lines long, the androphorum 7 lines in. diam. In Plate LI. I have copied the pyxidium from Berg's drawing, with the addition of the operculum; it is altogether 8½ in. high; the calycary zone is 8 in. across, and 3½ in. above the base; the interzonal band is 2 in. high; the upper zone and operculum 4 in. in diam.; the latter, as stated by Berg, is 2⅓ in. high; the breadth of the rim of the mouth 9 lines, its orifice 3 in. wide; the columella descends 2 in. lower; the pericarp, 9 lines thick, weighs 3 or 4 lbs.; the seeds are 1¾ in. long, 1⅛ in. broad.

18. Lecythis sphæroides, nob.: planta ignota: pyxidio majusculo, subsphærico, imo semigloboso, circa medium zona calycari annulari ambitu circulari paullo prominente cincto; vitta interzonali subacclivi, diametri tertiam partem fere alta; zona superiore integra, orbiculari, quam calycari paullo minore; operculo circulari, pulvinatim convexo, vitta dimidio breviore, subtus columella primum crassissima dein subito conica et profunde 4-cavernosa aucto; pericarpio subleviter lignoso, crassissimo, extus in lacunas longiusculas irregulares profunde corrugulato, circa zonam calycarem læviusculo; operculo subruguloso, intus obsolete 4-loculari. In Amazonas: *v. fr. s. in Mus. Morson. et meo*, Cametá (*Farriss*).

The pyxidium only is known (Plate LII.), which somewhat resembles that of *L. Pisonis*, but has a much wider upper zone and operculum, with a broader marginal mouth and a much thicker pericarp of a lighter woody tissue. It is 7 in. high, 7½ in. broad at the slightly undulating calycary zone, which is 3¼ in. above the base; the interzonary band is 2¼ in. high; the upper zone is 5½ in. in diam., with a flattish inclined mouth

1 in. deep, narrowing the inner mouth to a breadth of 4 in.; the pericarp is $1\frac{1}{8}$ in. thick at the interzonal band, $1\frac{1}{2}$ in. thick in the lower moiety.

19. Lecythis biserrata, nob.: *Lecythis lanceolata*, Berg (non Poir.) in Mart. Fl. Bras. *l. c.* p. 482, tab. 7. fig. 156, tab. 62 (excl. syn.); Linn. xxvii. p. 452: *Lecythis ollaria*, Saldanha (non Linn. nec Vell.), Configuração, p. 70, Desenhos, tab. 8: arbor magnifica frondosa, ramis patentibus, ramulis pendentibus, tenuissimis, subflexuosis, lenticellatis, glauco-opacis; foliis lanceolatis, imo subrotundatis, aut subito cuneato-acutis, apice longiuscule attenuatis, acumine obtusulo, rigidule chartaceis, inæqualiter biserrulatis, dentium margine ciliato-pruinoso, supra læte viridibus, utrinque nervis tenuissimis venis crebre reticulatis costaque tenui prominulis, subtus olivaceis, nervis flavidis; petiolo tenui, limbo 12plo breviore: panicula terminali, ramis laxis, racemosis, vel racemis axillaribus, folio longioribus, sub-10-floris; rachi tenuissima, floribus aromaticis; pedicellis calycem æquantibus, minutissime puberulis; sepalis ovatis, obtusis, extus cano-pruinosis; petalis obovatis, crassiusculis, violaceis, imo pallidis; androphoro albo; ovario infero, turbinato, 4-loculari, vertice plano, radiatim striato; stylo brevi, crassiusculo; stigmate subgloboso: pyxidio majusculo, depresse globoso, imo turbinato, profunde sulcato et umbilicato, longe infra medium zona calycari prominente annulari subundulata cincto, ambitu circulari; vitta interzonali parum convexa, zonæ calycaris diametri tertiam partem alta; zona superiore ampla, paullo angustiore, subquadrato-orbiculari; operculo lato, pulvinatim depresso, diametri fere septimam partem alto, subtus columella crassa truncata imo 4-sulcatim obconica aucto; pericarpio obsolete 4-loculari, crasso, subspongioso-lignoso, areolis magnis irregularibus impresso. In Brasilia, prov. Rio de Janeiro: *v. pl. in herb. Hook.*, Montibus Organensibus, ad Mandiocca (*Riedel*, 4); *fruct. non vidi.*

A magnificent tree, according to Sen. Saldanha, with a trunk more than 2 feet in diameter, bare to the height of 80 feet, when it separates into three short sections, subdivided into numerous wide-spreading branches, with copious foliage, the branchlets being extremely slender and pendulous; the axils are $\frac{3}{4}$ in. apart; the leaves are 2–4 in. long, $\frac{1}{2}$–$1\frac{1}{8}$ in. broad, on petioles 2–3 lines long, having about 16 pairs of very fine nerves, with many others intermediate and shorter, all anastomosing into a very close and prominent reticulation; the branches of the terminal panicle are 1–3 in. long; the rachis of the axillary racemes is $1\frac{1}{2}$ in. long; the pedicels are 1 line long; the sepals 2 lines; the petals 6 lines long, 5 lines broad; the flower expanded $1\frac{3}{8}$ in. across. The pyxidium (Plate LII.), with the addition of the operculum, according to Berg's drawing from a specimen in the Berlin herbarium, is nearly $6\frac{1}{2}$ in. high; the diameter of the calycary zone is 8 in. in diam., and 2 in. above the base; the interzonary band is $2\frac{3}{4}$ in. high; the upper zone is $6\frac{1}{4}$ in. across, the operculum being of the same diameter, and 16 lines high; the margin of the mouth is 9–10 lines broad, the orifice $4\frac{3}{4}$ in. wide.

Sen. Saldanha's full description of this species is good, and his drawing of it tolerable; but his figure of the fruit, reduced to $\frac{1}{5}$ nat. size, must be rejected, because it shows an impossibility, as the operculum is twice the diameter of the upper zone, on which it

ought to fit closely; and the interzonary band is much too short. He is unquestionably wrong in referring the species to *L. ollaria*, Linn.

Berg's account is more than usually full of errors. He first refers it to Poiret's Guiana species, to which certainly it does not belong, as I have verified in Commerson's specimen; and secondly he identifies it with Velloz's *L. minor*, an extremely different plant both in its leaves and fruit, as I have elsewhere demonstrated. There is another great error in his account of the fruit. This is at variance with his drawing, which is taken from a specimen collected in Rio de Janeiro by Pohl, and now in the Berlin Museum. In this the diameter of the upper zone is $6\frac{1}{2}$ in., whereas in the description it is stated to be only $3\frac{1}{4}$ in., a discrepancy which might be attributed to a typical error if it had not been accompanied by the word "parvo." I have copied that drawing in my Plate LII., with the addition of the operculum, 16 lines in height, as he states it to be in the specimen. Riedel's specimen of the plant agrees with Saldanha's figure, and bears on the accompanying ticket in Riedel's writing "*Lecythis Pohlii*, teste Berg." It is, however, certainly different from that species, showing how loosely Berg gave his authority from memory, without comparing the plants.

20. Lecythis limbata, nob.: pyxidio latissime urceolato, imum versus subconstricto, profunde 6-sulcato, -lobato et umbilicato; supra medium zona calycari latissime expansa ambitu sinuato-hexagona angulis subacutis subreflexis cincto; vitta interzonali sensim acclivi, diametri fere 4tam partem alta; zona superiore circulari, ampla, fauce crassiuscula et convexe declivi; operculo ignoto; pericarpio crasso, subleviter lignoso, grosse ruguloso, cum areolis impressis medio lenticellis flavidis granulatis signato, obsolete 4-loculari. In Brasilia: *v. fruct. siccum in Mus. Brit.* (sine altera indicatione).

The pyxidium of this very distinct species (Plate LIII.), from the mouth to the base, is $6\frac{1}{4}$ in. long; its diameter beneath the calycary zone is $5\frac{3}{4}$ in.; the latter, suddenly projecting like a reflected cornice, is $8\frac{1}{2}$ in. in diam., and $4\frac{1}{2}$ in. above the base; the interzonary band is $1\frac{3}{4}$ in. high, 7 in. in diam. at its base, where it rises from the zonal lobes, curving and narrowing upward to the upper zone, which is $4\frac{1}{2}$ in. in diam.; the mouth inclines inwards, narrowing to an orifice $2\frac{3}{4}$ in. broad; the pericarp is $\frac{3}{4}$ in. thick below the calycary zone, and $1\frac{1}{2}$ in. thick at the interzonary band; the depth of the internal space below the upper zone is $3\frac{3}{4}$ in., its internal diam. is $4\frac{1}{4}$ in.

21. Lecythis venusta, nob.: *Lecythis grandiflora*, Benth. (non Aubl.) in Hook. Journ. Bot. ii. 324: ramulis teneris, fuscis, opacis, striolatis, rugulosis, lenticellis flavidis verruculosis; foliis elliptico-lanceolatis, vel oblongis, imo obtusis, vel subacutis, apice in acumen brevissimum acutum subito constrictis, integris, vel obsoletissime serrulatis, marginibus subrevolutis, chartaceis, supra profunde viridibus, leviter opacis, minutissime granulatis, nervis semiimmersis, venis reticulatis, subtus rubidule brunnescentibus, opacis, costa striata nervis flavidis venisque prominentibus; petiolo tereti, canaliculato, subtus corruguloso, limbo 9–12plo breviore: paniculis axillaribus et terminalibus, brevibus; floribus plurimis, mediocribus, incarnatis;

pedicellis calyci æquilongis, fuscis, corrugulatis; sepalis 6, ovatis, subacutis, imo gibbosis, fuscis, minutissime scabridulis; petalis ovalibus; ovario subinfero, imo toruloso, 4-loculari, ovulis paucis e funiculis radiantibus, vertice depresse pulvinato, radiatim costato; stylo tereti subtenui, sepalis æquilongo: pyxidio longiuscule turbinato, imo angustiore profunde sulcato et umbilicato, corpore obconico, supra medium zona calycari ambitu hexagona prominente 6-lobata cincto; lobis longiusculis compressis, late cornutis, subacutis, inflexis, linea undulata nexis; vitta interzonali altiuscula, imo concava, dein convexa et fere erecta, diametri 4tam partem alta; zona superiore inferiore minore, circulari; operculo vittæ altitudine, pulvinato, depresse convexo, obtuse umbonato, solido, subtus truncato et in fossis 4 cavato, columella obconica 4-sulcata cum eo continua; pericarpio crasso, ponderose ligneo, pallide brunneo, lacunis plerumque profundis granulatis cancellatim areolato; operculo simillime signato. In Guiana: *v. s. in herb. Hook. et Mus. Brit.*, Berbice (*Schomb.* 286); Guiana (*Martin*); Surinam (*Hostmann*, 1302); *v. fruct. in Mus. Soc. Linn.* Guiana (*Schomb.* sub *L. grandiflora*); *in Mus. Kew. et meo*, Demerara (*Boughton*).

This is a large tree, called *Cacarola*; its branchlets with axils $\frac{1}{2}$–1 in. apart; the leaves are $3\frac{3}{4}$–9 in. long, 1–$3\frac{1}{4}$ in. broad, on a petiole 5–7 lines long, and with about 15 pairs of principal nerves, with others shorter and intermediate; the many-flowered axillary raceme is $3\frac{1}{2}$–5 in. long; the pedicels 2–3 lines apart, 1–2 lines long; the sepals 2 lines long, 1 line broad; the petals 10 lines long; the style curved, as long as the sepals; the pyxidium (Plate 55) is $6\frac{1}{4}$ in. long; the calycary zone, 5 in. above the base, is $5\frac{1}{4}$–$5\frac{1}{2}$ in. in diam.; interzonary band 1 in. high; diam. of upper zone 3–$3\frac{1}{4}$ in., contracted in its mouth to 2 in., with a shelving surface; depth of cell $3\frac{3}{4}$–4 in., its internal diam. $3\frac{1}{4}$ in.; the fruit is identified with the plant, both bearing the same name, annexed to them by Schomburgk. The oblong seeds, $1\frac{3}{8}$ in. long, $\frac{3}{4}$ in. broad, are of a dark-brown colour, with several furcated costate ridges, pruinosely opaque; and they are suspended a little below the summit by a fleshy funicle of nearly similar size. This species differs from *L. grandiflora*, Aublet, to which it was referred by Schomburgk, in its narrower elongated lanceolated leaves, its shorter racemes, with a more slender and straighter rachis, very much smaller and more approximated flowers, of a pink colour, upon shorter pedicels, in its ovary with a more depressed vertex, in its more turbinate pyxidium with an impressed cancellated surface, in a different calycary zone, a narrower upper zone, with a more contracted and shallower mouth.

22. LECYTHIS COGNATA, nob.: ramulis rubidule brunneis, opacis, striolatis, lenticellis flavidis verruculosis; foliis ovato-oblongis, vel elongato-oblongis, imo obtusis vel paullulo acutioribus, apice acute acuminatis, marginibus subintegris, chartaceis, supra læte aut pallide viridibus, subnitidis, nervis divaricatis, subtus pallidioribus, rubescentibus, aut fulvioribus, costa nervisque prominulis, valde reticulatis; petiolo fusco, supra canaliculato, subtus transverse corrugulato, limbo 11–14plo breviore: paniculis terminalibus, ramosis, rachi rufescente-pruinosa, sulcata, nodosa; pedicellis subnutantibus; sepalis oblongis, crassiusculis, concavis, incurvatis, carinatis,

imo gibbosis; petalis oblongis, flavis; ovario semisupero, imo breviter turbinato, corrugulato, vertice alto, conice cupulato, flavide maculato, distincte 4-loculari, ovulis paucis, funiculatis; stylo tereti, subbrevi. In Guiana: *v. s. in herb. Hook.* (*Talbot*).

The entire plant presents a rufescent hue; the axils of its branches are about $1\frac{1}{2}$ in. apart; the leaves are $5\frac{1}{2}$–9 in. long., 3–$3\frac{1}{4}$ in. broad, on a petiole 6–7 lines long; the rachis of the panicle is about 5 in. long, of its branches 2–3 in. long, distance between alternate flowers 6 lines; pedicels 3 lines; sepals 2 lines long, 1 line broad; petals 6 lines long. It differs from *L. amara*, Aubl., in its more acuminated leaves, which are not very reticulated, in its longer inflorescence, its petals not glutinous, and the structure of the ovary by which the two plants fall into two distinct genera. It differs from *L. venusta* in its general appearance, in its inflorescence, especially in its semisuperior ovary, dome-shaped vertex, which is smooth and covered with minute red spots; the fruits of the two species, in consequence, will probably be very different in form.

23. Lecythis tumefacta, nob.: planta ignota: pyxidio urceoloto-turbinato, imo sensim angustiore, 4-lobatim sulcato, rotundiusculo, et circa pedicellum crassiore et umbilicato, paullo supra medium zona calycari ambitu sinuato-hexangulari prominente cincto; lobis cum angulis 6, magnis, convexis, valde tumidis; vitta interzonali ogivaloconvexa, diametri 4ta parte alta; zona superiore circulari, integra, inferiore dimidio angustiore; operculo vitta altiore, crassissimo, valde pulvinato et convexo, cum columella infra adnata, hac acute obconica, 4-sulcata, fere ad basin loculi descendente; pericarpio crasso, spongiose lignoso, fulvo-brunneo, pulverulenti-pruinoso, areolis majusculis ferrugineo-granulatis cancellatim impressis exsculpto, obsolete 4-loculari; seminibus in quoque loculo circa 5, oblongis, pallide brunneis, irregulariter costatis, subscrobiculatis, funiculo albo carnoso paullo minore suspensis. In Guiana Britannica: *v. fruct. sic. in Mus. Kew.*, tria exempla sine operculo, et *in meo* cum operculo; Demerara (*Boughton*).

The fruit of this species (Plate LV. fig. 4) approaches that of the following (*crassinoda*), but differs in being smaller, in its calycary zone placed above the middle, not sharply angular in its periphery, in being tumidly swollen, with its lobes very rounded and thick, in a less elevated interzonal band, a smaller upper zone; the operculum is more pulvinate, quite convex, and the columella longer; the seeds are smoother, less granulated.

It is 5 in. long, the calycary zone $3\frac{1}{2}$ in. above the base, with an undulating sharpish edge, orbicular in form, hollowish beneath, $5\frac{3}{4}$ in. in diam., the tumesecent lobes being $\frac{3}{4}$ in. thick; the interzonal band is $\frac{1}{2}$ in. high; the upper zone 3 in. in diameter, with an inclined aperture in the mouth, 2 in. across; the operculum $1\frac{1}{2}$ in. high, $3\frac{1}{4}$ in. broad at its pulvinate base, the attached columella 3 in. deep; the pericarp is $\frac{5}{8}$ in. thick, the inner space $3\frac{1}{2}$ in. deep, and $5\frac{1}{2}$ in. in diam.; the seeds are $1\frac{5}{8}$ in. long, $\frac{3}{4}$ in. broad.

24. Lecythis crassinoda, nob.: ramulis tenuibus, teretibus, brunneo-opacis, angulato-striatis; foliis oblongis, vel elongato-oblongis, imo subobtusis et in petiolum sub-

acutatis, apice in acumen breve acutissimum subito constrictis, tenuiter chartaceis, subintegris, aut levissime crenato-serratis, margine paullo revoluto, supra læte viridibus, subopacis, nervis tenuissimis subimmersis, costa tenui prominula, subtus pallide viridibus, opacis, costa nervisque prominentibus, venis reticulatis vix conspicuis; petiolo tenui, canaliculato, marginibus incurvis, subtus ruguloso-striato, limbo 9plo breviore: inflorescentia ignota: pyxidio majusculo, urceolato-vasiformi, imo angustiore umbilicato, infra medium turbinato et profunde 6-sulcato, supra medium zona calycari prominente ambitu acute hexagona ad angulos grosse 6-lobata cincto, lobis valde tumidis; vitta interzonali ogivaliter inflexa, grosse rugosa, diametri tertiam partem alta; zona superiore circulari, integra; operculo alte pulvinato ogivali, truncatim convexo, centro obsolete umbilicato, diametri tertiam partem alto, obsolete granulato, subtus columella descendente aucto, hac primum faucem implente, dein acute conica et 4-sulcata; pericarpio crassissimo, subligneo, pallide brunneo, opaco, grosse foveolato, foveolis impressis granulatis, 4-loculari; seminibus in quoque loculo circ. 12, oblongis, sub-6-costatis, undique creberrime granulosis, ferrugineo-brunneis. In Guiana: *v. s. in herb. Hook.*, Rio Massaruni, Essequibo (*Appun*, 4, sub *L. grandiflora*); *v. fruct. in Mus. Brit.*, Guiana (*Appun*).

The fruits were sold among the late Mr. Appun's effects, and may be taken to belong to the plant above quoted, which has no inflorescence. It belongs to a tree bearing the vernacular name of *Wadaduri*; its leaves are 3–4 in. long, 1–1$\frac{3}{4}$ in. broad, on a petiole 4–5 lines long, and have about 12 pairs of nerves, arcuately conjoined near the margin. The pyxidium (Plate LIV.) is 8$\frac{1}{2}$ in. long, much constricted and sulcated near the base, subcylindrical and 6-sulcate below the calycary zone, which is 4$\frac{1}{2}$ in. above the base, and projects 1 in. all round, being there sharply hexangular, acute at the thickly tumified angles, the lobes, 1$\frac{1}{4}$ in. thick, being connected by a sharp linear ridge; the interzonal band ascends from the lobes in ogival form, and is 2 in. high; the superior zone is 3$\frac{3}{4}$ in. across, having within it a nearly horizontal mouth, contracted at its sharp edge to a diameter of 1$\frac{1}{2}$ in.; the operculum, pulvinate at its base, is 3$\frac{7}{8}$ in. broad, and 1$\frac{3}{4}$ in high, with a thick flattened convex summit.

25. Lecythis Coxiana, nob.: ramulis subtenuibus, pendentibus, griseo-pruinosis, striolatis, lenticellatis; foliis ellipticis, imo subito acutis, apice in acumen acutum constrictis, tenuiter chartaceis, marginibus breviter obtuseque serrulatis, et versus petiolum revolutis, supra saturate viridibus, nervis tenuibus venisque creberrime reticulatis semiimmersis, costa prominula, subtus paullo pallidioribus, costa nervisque flavidis prominulis; petiolo tenui, supra sulcato, subtus corrugulato, limbo 12plo breviore: inflorescentia ignota: pyxidio turbinato, imo subito constricto, obsolete 6-sulcato, zona calycari valde explanata ambitu ansis 6 crassis tumescentibus margine acutis cum sinibus totidem alternantibus cincto; vitta interzonali paullo elevata, acclivi; zona superiore orbiculari; fauce convexe decliva; ore minore; pericarpio levi pondere, extus rugose corrugato et tuberculato, foveatim vario, lato,

obsolete 4-loculari; seminibus oblongis, costis subparallelis crenulatim rugosis, funiculis carnosis majusculis suspensis. In Brasilia, prov. Rio de Janeiro, ad fluv. Macacú, *v. pl. s. et fruct.* a cl. C. Cox donati.

A tree growing along the margin of the Rio Macacú, which flows from the eastern extension of the Organ Mountain-range into the N.E. extremity of the great bay of Rio de Janeiro; the axils on its branches are about 1 in. apart; the leaves have a very lurid appearance on both sides, are 3–4½ in. long, 1½–2 in. broad, on petioles 3–4½ lines long, having about 15 pairs of very fine nerves, with others shorter and intermediate.

The pyxidium (Plate LVI. figs. 3, 4, 5) is 4½ in. long, 6½ in. broad at the calycary zone, which is very prominent, and about 3 in. above the narrow constricted base; the interzonal band, much inclined, is ¾ in. high; the upper zone and operculum are 4½ in. in diam.; the latter is ¾ in. high, with a low umbonate knob in the centre, and is furnished beneath with a columella ¾ in. thick, where it fills the mouth, then suddenly contracted and 4-grooved to a further depth of 1 inch; the seeds are apparently only 1-seried, 1½ in. long, ¾ in. broad, suspended by fleshy funicles ¾ in. long. The pericarp is 1 in. thick at the sides, 1⅜ in. at the base, its inner space being 2 in. deep below the orifice, and 3 in. wide. Specimens of the fruit and suspended seeds were sent to me preserved in spirits.

26. Lecythis tuberculata, nob.: *Lecythis minor*, Vell. (non Jacq.), Fl. Flum. p. 222, Icon. v. tab. 85: arbor mediocris; ramulis tenuissimis teretibus, pallide brunneis, grisco-pruinosis, sparse lenticellatis, apice foliiferis, imo nudis, cum racemulis floriferis ex axillis nudis: foliis oblongis, vel lanceolato-oblongis, imo in petiolum breviter acutatis, apice in acumen anguste obtusulum subrepente attenuatis, distincte serratis, dentibus obtusis, subchartaceis, supra læte viridibus, subnitentibus, nervis tenuibus venis reticulatis costaque carinata prominentibus, subtus pallidioribus, nervis venisque albidis prominentibus, costa prominente, pruinosa; petiolo tenui, supra plano, limbo 24plo breviore: racemis axillaribus, brevissimis, paucifloris, aut foliis delapsis longius spicatifloris; rachi opace pruinosa, circ. 6–8-flora; floribus mediocribus; pedicellis brevibus, recurvulis, sulcatis, pruinosis; sepalis ovalibus, extus granulato-pruinosis, margine ciliolatis; petalis ovatis; ovario infero, turbinato, 4-loculari, ovulis pluribus axi radiatim affixis, vertice plano radiatim striato; stylo brevi, apice crassiore; stigmate parvo, albido: pyxidio turbinato, imo rotundato, sulcato et umbilicato, supra medium zona calycari annulari valde prominente cincto, hac ambitu hexagona, angulis tuberculis 2 magnis donatis; vitta interzonali convexe acclivi, diametri 4tam partem alta; zona superiore suborbiculari quam inferiore angustiore; operculo convexo, solido, cum columella adnato, hac infra medium obconice 4-sulcata aucto; pericarpio fusco, ecorticato, crasso, lignoso, obsolete 4-loculari, extus operculoque grossiuscule et profunde tuberculato; seminibus oblongis, utrinque obtusis, irregulariter costato-sulcatis, fuscis, funiculo magno carnoso albo suspensis. In Brasilia: *v. v. pl. et fruct.* in prov. Rio de Janeiro, ad Freixal.

A small tree, of no great height, abundantly branched, found at the head of the Bay

of Rio de Janeiro; it agrees well with the characters of that found by Velloz at Ilha Governador in the same bay. The axils of its branchlets are $\frac{3}{4}$–1 in. apart; the leaves are 2–4 in. long, $1\frac{1}{4}$–$1\frac{3}{4}$ in. broad, on a petiole 2 lines long, with about 12–15 pairs of slender nerves, with others shorter and intermediate, all anastomosing; the axillary raceme is $1\frac{1}{2}$ in. long, its floriferous nodes 2 lines apart, the pedicels 2 lines long; the sepals $1\frac{1}{2}$ line long; petals 4 lines long, 5 lines broad, concave, yellow; androphorum globosely inflected, 6 lines in diameter; the pyxidium (Plate LVI. fig. 1) is $5\frac{3}{4}$ in. long, 4 in. broad below the calycary zone, which is 6 in. in diam., and 4 in. above the base; the interzonary band $\frac{3}{4}$ in. broad; operculum 3 in. in diam. and $\frac{3}{4}$ in. high, increased beneath by the columella, which fills the mouth, where it is 1 in. thick, and then descends obconically to the middle of the cell; the pericarp is $\frac{5}{8}$ in. thick, its inner space 4 in. deep below the opercular zone, and 4 in. in diam.; the seeds are $1\frac{1}{4}$ in. long, $\frac{3}{4}$ in. broad, suspended from a large lateral hilum a little below the summit by a fleshy funicle of nearly equal size; the nucleus is amygdaloid, edible, and of a pleasant flavour.

27. LECYTHIS GRANDIFLORA, Aubl. ii. 712, tab. 283, 284, 285, in parte (non excl. syn. Benth.); DC. Prodr. iii. 291; Berg in Linn. xxvii. 454: arborea; ramulis fuscis, striolatis, lenticellis sparse verruculosis; foliis majusculis, ovato-oblongis, imo rotundiusculis, et in petiolum brevissime constrictis, apice obtusis, in acumen brevissimum acutum repente attenuatis, crenulatis, margine revoluto punctato, chartaceis, supra viridibus, subopacis, nervis adscendentibus venisque reticulatis paulo prominulis, costa imo crassiore sulcata, subtus fere concoloribus, valde opacis, costa valida nervis flavidis venisque prominentibus; petiolo validissimo, fusco, marginibus tenuibus involutis, limbo 8plo breviore: racemo terminali, folio breviore; rachi validissima, angulato-sulcata, valde geniculata, longe nodosa, crebre lenticellata, subremotiflora; pedicellis validis, angulato-corrugulosis, imo bractea majuscula decidua oblongo-ovata crassa subsessili recurvata donatis; sepalis orbicularibus, concavis, submembranaceis, lenticellatis, pruinosis; petalis maximis, oblongis, subinæqualibus, concavis, roseis; ovario semiinfero, 4-loculari, ovulis numerosis affixis, vertice alte pulvinato, conice convexo, radiatim striato; stylo tereti, longiusculo: pyxidio majusculo, turbinato-oblongo, supra medium zona calycari annulari prominente obsolete 6-loba ambitu subhexagona cincto; vitta interzonali introrsum sigmoideo-convexa, diametri 4tam partem alta; zona superiore integra, inferiore dimidio angustiore; operculo vittæ altitudine, pulvinatim convexo, apice umbonato, solido, cum columella crassa primum obconica dein acuta et profunde 4-sulcata continuo; pericarpio crasso, obsoletissime 4-loculari; seminibus plurimis, magnis, oblongis, subcostatis, funiculo magno carnoso suspensis; nucleo eduli. In Guiana: *v. pl. s. spec. typ. in herb. Mus. Brit.*, Cayenne (*Aublet*); Guiana (*Martin*): *fruct. non vidi.*

A lofty tree, with a trunk 30 feet long; the axils of its stout branchlets are $\frac{3}{4}$–$1\frac{1}{4}$ in. apart; the leaves are 6–10 in. long, $2\frac{3}{4}$–4 in. broad, on a petiole $\frac{3}{4}$–1 in. long, and with about 14 pairs of divaricated nerves and others shorter intermediate, all anastomosed towards the margin; the rachis of the raceme is $3\frac{1}{2}$–6 in. long, with projecting nodules

2 lines long and 4–9 lines apart; each nodule bears an articulated pedicel 4 lines long; the reflected bract is 6 lines long, 3 lines broad; the flower expanded is $4\frac{1}{2}$ in. in diam.; the sepals 5 lines in diam.; the petals $1\frac{1}{2}$–2 in. long, $1\frac{1}{4}$ in. broad; the androphorum $\frac{3}{4}$ in. broad, curving into a semiglobose summit, and 3 in. long; fertile stamens over disk upon truncated processes $1\frac{1}{2}$ line long, sterile processes on hood 4–6 lines long; the pyxidium (Plate LVII. fig. 1) is $6\frac{1}{2}$ in. long, calycary zone 5 in. in diam., its height from base 4 in.; interzonary band 1 in. high; upper zone and operculum 3 in. in diam., $1\frac{3}{4}$ in. high; mouth of upper zone contracted to $1\frac{3}{4}$ in.; depth of columella $3\frac{1}{4}$ in.; pericarp $\frac{3}{4}$ in. thick: the admeasurements from Aublet's reduced figures are here restored to their proper size; seeds $1\frac{3}{4}$ in. long, 1 in. broad. The fruit is called in Cayenne *Canari-macaque*, or Monkey-pot.

28. Lecythis variolata, nob.: foliis ovatis, imo subrotundatis et subito in petiolum longiuscule productis, apice sensim obtusis, marginibus dentibus parvis sursum mucronatis serrulatis, subcoriaceis, supra læte viridibus, nervis subpaucis divergentibus venisque crebre reticulatis prominulis, costa subtus prominente; petiolo lato, subtenui, canaliculato, alte marginato, limbo 5plo breviore: floribus in axillis superioribus solitariis, flavis; pedicellis validiusculis, subnutantibus, calyce 3plo longioribus, imo bracteola rotunda minima munitis; sepalis 6, rarius 7, obtusis, imo latioribus, expansis, extus convexis; petalis 6–7, duplo longioribus, rotundatis, concavis, reflexis, membranaceis; ovario turbinato, sæpius 4- rarius 5-loculari, vertice subconcavo, radiatim striato, margine elevato et crenulato; disco latiusculo; stylo brevissimo, umboniformi; stigmate minute 4-lobo: pyxidio subsphærice turbinato, paullo supra medium zona calycari annulatim subprominula undulata ambitu obsolete hexangulari cincto; vitta interzonali subconvexa, diametri 4tam partem alta; zona superiore circulari, integra, quam calycari $\frac{2}{3}$ minore; operculo conformi, margine subacuto, subdepresse convexo, diametri 4tam partem alto, obsolete umbonato, cum columella primum truncata et faucem implente, 4-cavernosa et dein subito obconica et 4-sulcata; pericarpio obsolete 4-loculari, subcrasso, leviter lignoso, pallide brunneo, opaco, grosse corrugato, areolis granulosis majusculis irregularibus impresso-variolato, vitta grosse torulosa; operculo foveis minoribus variolato; seminibus plurimis, oblongis, costatis, funiculis carnosis fere æquimagnis suspensis. In Brasilia, Rio Janeiro, in Monte Corcovado et vicinis, in sylvis primævis: *v. pl. s. et fruct.* Tejuca (*Bennett*), Rio Macacú (*Cox*).

Specimens of the flowers preserved in spirits, and of the seeds and funicles in the same manner, as well as the dried fruits, were sent to me by Mr. Bennett. I have obtained several other specimens of the fruit from other localities within the province. The leaves are $1\frac{3}{8}$–$2\frac{1}{2}$ in. long, $1\frac{1}{8}$–2 in. wide, on a broad channelled petiole 3–4 lines long, and have 7 pairs of divergent nerves arcuately conjoined: the solitary pedicel is very thick. gradually incrassated, 4 lines long; the calyx expanded 8 lines across, the sepals 3 lines long, $2\frac{1}{2}$ lines broad at base; the petals 6 lines long, 5 lines broad; the androphorum large, the head is 12 lines long and 9 lines broad, its imbricated subulated appendages 4–5 lines long, mostly antheriferous. The inflorescence is described from specimens

preserved in spirit; the fruit in sections, with the seeds suspended from their large funicles, was sent preserved in the same manner. The pyxidium, of a pale fawn-colour (Plate LVII. fig. 4), is $5\frac{1}{4}$–6 in. long; the calycary zone, 3 in. above the base, is 6–$6\frac{1}{2}$ in. in diam.; the interzonary band is $1\frac{1}{2}$ in. high; the upper zone $3\frac{5}{8}$ in. broad, its inner mouth 3 in. in diam. and $\frac{5}{8}$ in. below the zone; the operculum $3\frac{5}{8}$ in. broad, $\frac{3}{4}$ in. high; the columella, filling the mouth, flatly truncated beneath, is suddenly contracted into a narrowish sulcated cone, descending halfway into the main cell; the pericarp is $\frac{5}{8}$ in. thick at the sides, and 1 in. at the base; the seeds are $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, $\frac{3}{4}$–1 in. broad, suspended on a yellowish fleshy funicle 1–$1\frac{1}{4}$ in. long, $\frac{3}{4}$ in. broad.

29. Lecythis minor, Jacq. (non Vell.) Amer. i. p. 168, tab. 109; edit. 8vo, p. 210; DC. Prodr. iii. 294; Berg in Linn. xxvii. 452: ramulis tenuibus, brunneis, subflexuosis, angulato-striatis, glabris; foliis longe ellipticis, imo obtusis, et in petiolum breviter acutatis, apice longiuscule et acute attenuatis, crebre serrulatis, submembranaceis, læte viridibus, utrinque concoloribus, nervis tenuibus supra subimmersis, subtus costaque paullo prominulis; petiolo fusco, canaliculato, tenuiter marginato, limbo 16plo breviore: racemis axillaribus et terminalibus, folio brevioribus; rachi crassiuscula, crebriflora; floribus majusculis, odoratis, albis; pedicellis brevissimis, crassis; sepalis subparvis, rotundato-ovatis, patentibus; petalis anguste oblongis, planis, subinæqualibus; ovario subinfero, 4-loculari, ovulis plurimis, radiantibus, vertice depresse convexo; stylo brevi, conico, crasso: pyxidio subgloboso, minore, imo hemisphærico, paullo supra medium zona calycari angulato-annulari sub-6-lobata prominente cincto, lobis tumidis; vitta interzonali latiuscula, subconvexa, diametri quintam partem alta; zona superiore integra, quam calycari minore; operculo pulvinatim convexo, solido, subtus late truncato, cum columella breviter cuneata 4-sulcata adnato; pericarpio crassiusculo, sublignoso, extus scrobiculatim rugoso, dissepimentis 4 fere evanidis; seminibus 6–8, oblongis, angulato-costatis, amaris. In Nova Granada ad Cartagena (*Jacquin*): *v. pl. s. in hb. Hook.* (hort. cult. sine flore); *v. fr. s. in Mus. Kew.*, Cartagena (*Archer*); *in Mus. meo*, Costa Rica.

A handsome tree, 60 feet high, growing in woods; its branchlets are slender, with axils 1–$1\frac{1}{2}$ in. apart; the leaves are 6 in. long, 2–$2\frac{3}{4}$ in. broad, on a petiole $1\frac{1}{2}$–2 lines long, and with about 15 pairs of nerves and reticulated veins. Jacquin states that the raceme is 2–3 in. long, with a stout straight rachis: the Kew specimen has no inflorescence: the flowers are almost sessile; the sepals are 2 lines long; the petals 1 in. long, $\frac{1}{2}$ in. broad; the basal part of the ligula of the androphorum and the basal ring are staminiferous; the semiglobose head is densely filled inside with echinated appendages, perhaps sterile, or with the anthers fallen off. The pyxidium (Plate XLIII. fig. 3) is 3 in. high, 3 in. in diameter across the prominent calycary zone, which is annular, with 6 obtuse knobs; its diameter is $2\frac{3}{4}$ in. below the calycary zone, which is $1\frac{1}{2}$ in. above the base; the interzonary band is 8 lines high; the upper zone and the opercular opening are $2\frac{1}{8}$ in. in diam.; the operculum, of the same breadth, is flatly convex, 8 lines high; the pericarp is 3 lines thick; the seeds are 1 in. long, $\frac{1}{2}$ in. broad.

The fruits are said to be collected in large quantities on the Rio Magdalena, and exported from Cartagena for the purposes of tanning.

30. Lecythis elliptica, H. B. K. vii. 259; DC. Prodr. iii. 329; Berg, Linn. xxvii. 449; *Gustavia dubia*, Berg, *l. c.* 446: ramulis pallide brunneis, opacis, ochraceo-pruinosis, tenuissime striolatis; foliis oblongis, imo rotundiusculis, et in petiolum breviter acutatis, aut ibi sæpe obsolete cordatis, apice latiuscule obtusis, et interdum subito breviter apiculatis, marginibus vix revolutis, crenato-subserrulatis, chartaceis, supra pallide viridibus, opacis, sub lente minute granulatis, nervis tenuibus patenter divergentibus semiimmersis, reticulatim venosis, costa tenui pruinosa, plana, imo dilatata et canaliculata, subtus pallide opacis, costa striolata pruinosa nervis venisque paullo prominulis, petiolo supra plano, dilatato, late marginato, subtus pruinoso, limbo 16–18plo breviore: panicula terminali, folio breviore, ramis paucis, brevibus, patentibus; rachi angulosa, opaca, nodis alternis et subapproximatis florigeris; pedicellis validis, brevissimis; sepalis subovatis, crassiusculis, expansis, extus carinatis et pallide pruinosis, marginibus membranaceis pectinato-denticulatis; petalis obovato-oblongis, obtusis, crassiusculis; ovario semiinfero, subsulcato, 4-loculari, vertice vix elevato subpulvinato radiatim striato; stylo sepalis breviore, subtereti, obtuso: pyxidio subparvo, cupulari, sub medium angustiore rotundato, 6-sulcato, medium versus zona calycari prominente annulari ambitu 6-lobata cincto, lobis tumidis; vitta interzonali convexa et sensim acclivi, apice introrsum convexa, diametri dimidio altitudine; zona superiori latissime circulari, ore suberecto; operculo ignoto: pericarpio pallide brunneo, imo crassissimo, lateribus tenuioribus, coriaceo-lignoso, minute granuloso et impresse varioloso, obsolete 4-loculari; seminibus oblongis, rufo-brunneis, leviter costatis. In Nova Granada, ad Morales, prope Rio Magdalena: *v. pl. s. in hb. Hook.*, prope Santa Marta (*Purdie*, 51); prope Cartagena (*Purdie*, 624); *in hb. Hanbury* (*Purdie*); *v. fr. s. in Mus. Kew.*, Rio Magdalena (*Purdie*).

This plant agrees well with Kunth's description of Bonpland's specimen from the same locality, and is said to be a wide-spreading shrub, 4–6 feet high, but sometimes a large tree 40 feet high, common in the swamps of the Magdalena. The leaves are $6\frac{1}{2}$–$6\frac{3}{4}$ in. long, $2\frac{7}{8}$–$3\frac{1}{4}$ in. broad, on a petiole 4–5 lines long, and having about 16 pairs of nerves, with others intermediate shorter, all archingly connected near the margins. The raceme is 8–12 in. long, with prominent nodes 3 lines apart, thick pedicels 2 lines long; sepals $2\frac{1}{2}$ lines long, $1\frac{3}{4}$ line broad; petals 15 lines long, 7 lines broad; the pyxidium (Plate LI. fig. 2) at its basal portion is 3 in. in diam., $1\frac{1}{4}$ in. high, above which the calycary zone suddenly expands to a diam. of 4 in.; the interzonary band is $1\frac{1}{8}$ in. high, $3\frac{1}{2}$ in. in diam.; upper zone $2\frac{1}{2}$ in. in diam.; the pericarp, $\frac{3}{4}$ in. thick below, 4 lines thick on the sides, is 2 in. deep, and $2\frac{1}{2}$ in. in diam. inside.

Dr. Berg (in Linn. xxvii. pp. 446 & 449) doubted the propriety of retaining this species; but the excellent specimens of Purdie prove the correctness of Kunth's diagnosis.

31. Lecythis dubia, H. B. K. (non Berg), n. gen. vii. 259; Berg in Linn. xxvii. 460 et 446: foliis oblongis, imo anguste cuneatis, apice acuminatis, basin versus integris, medio obsolete et obtuse dentatis, subcoriaceis, glabris, supra nervosis et reticulatis, subtus costa nervisque prominentibus; petiolo semitereti, glabro, limbo 12plo breviore: inflorescentia ignota; pedunculo fructifero longiusculo, glabro: pyxidio subparvo, subpoculiformi, imo rotundato et profunde 6-sulcato, paullo supra basin zona calycari prominente annulato ambitu 6-gono cincto, cum lobis 6, tumidis, subreflexis; vitta interzonali cylindrica, levi, diametrum fere alta; zona superiore operculoque orbicularibus et integris; operculo depresse pulvinato, diametri sextam partem alto, subtus columella aucto, hac primum faucem implente, dein repente conica et profunde 4-sulcata; pericarpio 4-loculari, pallide brunneo, imo crasso, latere tenuiore, leviter lignoso, extus lacunis plurimis rubellis variolato; seminibus 8, oblongis, rufo-brunneis, leviter costatis. In Nova Granada ad Rio Magdalena, ubi legit plantam Bonpland (*pl. non vidi*): *fructus vidi in Mus. Kew.*, Rio Magdalena (*Purdie*).

The incomplete specimen brought home by Bonpland is said by Kunth to consist only of a single leaf and an immature fruit in a decayed state; the leaf is 10–11 in. long, $3\frac{1}{2}$ in. broad, on a petiole $9\frac{1}{2}$ lines long; the peduncle (or rather part of the rachis of raceme?) is $1\frac{1}{2}$ in. long. In the Kew Museum, accompanying the pyxidium of *L. elliptica*, is another fruit, evidently belonging to a distinct species. The characters of that plant and those of the above show they are nearly allied, though very different species. The fruit of *L. elliptica* is well identified by Purdie's specimen; and I think we may safely refer the other fruit (Plate LI. fig. 3) to the species under consideration; and I have therefore added the particulars of it to Kunth's diagnosis. It is $2\frac{3}{4}$ in. long, the basal portion $\frac{1}{2}$ in. high; the calycary zone, immediately above this, is $3\frac{1}{4}$ in. in diam.; the interzonary band is nearly erect, and $1\frac{1}{2}$ in. high; the upper zone and operculum are $2\frac{1}{2}$ in. in diam., the latter $\frac{1}{2}$ in. high, its columella fills the mouth, descending below in a conical form, deeply channelled; the pericarp is $\frac{5}{8}$ in. thick at its base, $\frac{3}{8}$ in. thick at the sides; the seeds are $1\frac{1}{8}$ in. long, $\frac{1}{2}$ in. broad.

This species was confounded by Dr. Berg with another specimen in the Berlin herbarium, as related by me under *Gustavia dubia* (ante, p. 179).

32. Lecythis pilaris, nob.: planta ignota: pyxidio subparvo, imo exacte globoso, paullo supra medium zona lineari vix prominente sursum acutiuscula obsolete 6-loba ambitu fere circulari cincto; vitta interzonali acclivi, paullo convexa, diametri 4tam partem alta; zona superiore integra circulari, quam calycari angustiore; operculo ignoto; pericarpio crassissimo, dense lignoso, cortice crasso brunneo, opaco, reticulatim rimoso, obsolete 4-loculari. In Brasilia: *v. s. fr. in Mus. Fry.* (Rio de Janeiro).

In shape this fruit (Pl. XLII. fig. 3) much resembles that of *L. Pohlii*, but is nearly $\frac{1}{3}$ of its size. Without the operculum, the pyxidium is 2 in. high, and $2\frac{5}{8}$ broad below the calycary zone, which is $1\frac{1}{2}$ in. above the base, and $2\frac{1}{2}$ in. in diam.; the interzonary band

is $\frac{1}{2}$ in. high; the upper zone is $1\frac{3}{4}$ in. in diam., its inner mouth contracted to 1 in.; the lip $\frac{1}{2}$ in. broad; the internal depth below the upper zone is $1\frac{5}{8}$ in., its internal diam. $1\frac{7}{8}$ in.

33. Lecythis cupularis, nob.: planta ignota: pyxidio subparvo, imo hemisphærico, medio extrorsum subcurvato, supra medium zona calycari valde prominente annulari sub-6-loba cincto, lobis tumidis, margine acutis, supra planis, subtus convexis; vitta interzonali brevi, erectiuscula, subconvexa, diametri quintam partem alta; zona superiore integra, circulari; operculo ignoto; pericarpio haud crasso, spongioso-lignoso, cortice areolatim rimoso, ochraceo-brunneo, granulatim scrobiculato, obsolete 4-loculari, orificio verticali. In Brasilia Amazonica: *v. s. in Mus. Kew.*, vernac. "*Monkey's Stewpan*" (sine altera indicatione).

The above pyxidium (Plate XLIX. fig. 2) somewhat resembles that of *L. levicula*, but it is more globose, with a narrower erect interzonary band, a more acute calycary zone, and an erect mouth; it is 2 in. long from the base to the upper zone; calycary zone $1\frac{1}{4}$ in. above base and 3 in. in diam.; interzonary band scarcely $\frac{1}{2}$ in. high; upper zone 2 in. in diam., with an erect inner mouth; pericarp $\frac{1}{4}$ in. thick, depth of cell $1\frac{3}{4}$ in., its inside diam. 2 in., showing the traces of 4 dissepiments; externally it is not tuberculate, but subsmooth or finely granular, with a thin bark cracking into angular areoles.

34. Lecythis lævicula, nob.: planta ignota; pyxidio parvo, subgloboso, imo hemisphærico, medio extrorsum curvato, supra medium zona calycari annulari prominente obsolete 6-loba ambitu subhexagona cincto, lobis subtumidis; vitta interzonali convexe acclivi, diametri quintam partem alta; zona superiore circulari integra subminore; operculo ignoto; pericarpio suberasso, coriaceo-lignoso, lævi, pallide brunneo aut cinereo, indistincte tuberculato et minutissime granulato, obsolete 4-loculari. In Guiana Brit.: *v. s. in Mus. Kew.*, Demerara (*Parker*).

The pyxidium is small (Plate XLIX. fig. 3), only $2\frac{1}{4}$ in. long from the base to the upper zone, which is 2 in. broad; the calycary zone, $1\frac{3}{4}$ in. above the base, is $2\frac{7}{8}$ in. in diam.; the interzonary band $\frac{1}{2}$ in. high; the very light pericarp is 3–4 lines thick; the depth of inner cavity below the upper zone is 2 in., its internal diam. 2 in., the contracted mouth being $1\frac{3}{4}$ in. broad.

35. Lecythis platyzone, Berg in Mart. Fl. Br. *l. c.* p. 485: planta ignota: pyxidio subgloboso, imo turbinato et anguste truncato; supra medium zona calycari obsolete lobata et undulatim lineata margine acuto sursum spectante cincto; vitta interzonali apice obtuse acclivi, diametri quintam partem alta; zona superiore circulari, integra, ore contracto; operculo ignoto; pericarpio crassiusculo, suberoso-lignoso, extus exasperato, intus obsolete 4-loculari. In prov. Rio de Janeiro: *non vidi.*

The pyxidium of this species (Plate LII. fig. 2) differs from that of *L. pilaris* in its somewhat larger size, in being turbinate below, and in having a narrower interzonary band, in its thinner and more coriaceous substance, and its scrobiculately rugose (exasperate) surface. It is 3 in. long from the base to the upper zone, $3\frac{1}{4}$ in. broad in the

middle; the calycary zone is $2\frac{1}{2}$ in. above the base; the interzonary band is $\frac{1}{2}$ in. high; the upper zone is 2 in. in diameter, contracted at the mouth in a channelled acute lip. A species near *L. pilaris*; but why it is called *platyzone* it is difficult to see.

36. Lecythis longifolia, H. B. K. vii. 260; DC. Prodr. iii. 291; Berg in Linn. xxvii. 452: racemis teretiusculis, tenuissime canescenti-hirtellis; foliis sparsis, lanceolatis, imo acutis, apice acuminatis, conduplicatis, marginibus obsolete et remote dentatis, subcoriaceis, glabris, nervis parallele divergentibus, venis reticulatis, subtus costa nervisque prominentibus; petiolo subtereti, limbo 16–20plo breviore: inflorescentia ignota; floribus pedicellatis, pedicello glabro. In Venezuela, prov. Caraccas, in Aragua, ad ripam fluv. Orinoci, legit *Humboldt*: *non vidi*.

A tree seen by Humboldt and Bonpland, who collected an incomplete specimen, without inflorescence, with a single mutilated flower. It is called by the natives *Coco de Mono* (Monkey-pot), and is therefore most probably a true *Lecythis*; but Berg, without any assigned reason, doubts this, and, with some hesitation, refers it to *Gustavia*. The leaves are 8–10 in. long, 22–26 lines broad, on a petiole $\frac{1}{2}$ in. long; the pedicel is nearly an inch long. The species seems near *L. Zabucayo*, Aubl.

37. Lecythis integrifolia, R. & P., Syst. Fl. Per. 8vo vol. ined. p. 529: ramulis teneris, teretibus, brunneis, opacis, striatis, lenticellatis; foliis elongato-oblongis, imo rotundatis vel obtusis, apice in acumen acutum subbreve subito constrictis, marginibus tenuibus integris, vel obsolete crenatis, tenuiter chartaceis, supra planis, læte viridibus, opacis, nervis paucis tenuissimis semiimmersis, divergentibus et longe adscendentibus, valde reticulatis, subtus brunnescentibus, opacis, costa tenui nervis venisque flavidis prominentibus; petiolo tenui, marginibus valde involutis, limbo 15–18plo breviore. In Ecuador: *v. s. in herb. Hook.*, Guayaquil (*Pavon*), *ex hb. Limens.* a Mathewsio acquisitam (sine flore).

Mathews quotes this species as described in p. 529 of the Syst. of Ruiz and Pavon, in one of the unfinished volumes, which I have not seen, as the last published does not extend beyond p. 455. He sent a specimen of the plant, without flowers, to Sir Wm. Hooker, obtained from the Pavonian herbarium in Lima, from which the above diagnosis is obtained. The axils of its slender branchlets are $\frac{3}{4}$–1 in. apart; the leaves are 5–8 in. long, 2–$2\frac{1}{2}$ in. broad, on a petiole 4–5 lines long, and they have about 6 pairs of nerves, with other shorter and intermediate ones, all anastomosed. We do not, therefore, know for certain that this plant is a true *Lecythis*; it bears more the appearance of an *Eschweilera*.

38. Lecythis Langsdorffii, Berg in Mart. Fl. Bras. *l. c.* p. 615: ramulis angulato-sulcatis, rimosis; foliis oblongis, vel elliptico-oblongis, imo complicatis et in petiolum breviter attenuatis, apice in acumen breve recurvum abrupte constrictis, subintegris, vel ad marginem subrevolutum punctis obsolete serrulatis, chartaceis, supra luride viridibus, valde opacis, ad nervos impressos sulcatis, venis crebre reticulatis immersis, subtus spadiceo-brunneis, valde opacis, subpulverulentis, costa

prominente, nervis venisque prominulis, petiolo sulcato crenulatim marginato, limbo 14plo breviore: racemis terminalibus, folio dimidio brevioribus; rachi angulata, verrucosa; pedicellis brevibus, recurvis, angulatis, rugulosis, pilosulis; sepalis oblongis, subacutis, inæqualibus, margine membranaceis, apice ciliolatis, maculatis, parallele striatis, breviter sparse et adpresse pilosulis; petalis obovatis, albis, membranaceis; ovario infero, hexagone turbinato, ruguloso, 4-loculari, ovulis plurimis ab axi 3-seriatim radiantibus, vertice intra discum subconcavo, radiatim striato, medio conice elevato; stylo tereti, subincurvo; stigmate parvo, sub-4-lobo, albo. In Amazonas: *v. s. in herb. Hook.*, San José, Rio Negro (*Riedel*, 1450).

This plant quite agrees with the characters assigned to this species by Berg, although, in evident forgetfulness, the name of "*Lecythis Riedelianum* teste Berg" was written by Riedel on the specimen, the latter being a species of *Eschweilera*. It is a tree 20 feet high, found by Riedel at the fort, Marabitana, S. José, opposite the confluence of the rivers Negro and Casiquiare, on the confines of Brazil and Venezuela; its leaves are 3–5 in. long, 1–2 in. broad, on petioles 3–6 lines long, and have about 12 pairs of nerves; the rachis of the terminal raceme is 3½ in. long, with flowers about 3 lines apart; the pedicels are 1½ line long; the sepals 2 lines long, 1 line broad; the rounded petals 6–8 lines long, 4 lines broad; the androphorum has a very convex semiglobose head lacinulated and incurved at the margin, densely charged inside with shortish appendages, most of which are antheriferous.

39. Lecythis Martini, Berg in Mart. Fl. Br. p. 616: ramulis teneris, verruculosis; foliis oblongis, vel ovali-oblongis, imo obtusatis et breviter acutis, apice recurvato-acuminatis, subintegris, vel ad marginem e punctis fuscis obsolete serrulatis, chartaceis, nervis patulis, marginem versus adscendentibus et arcuatim nexis, cum aliis brevibus interjectis, costa carinata, flexuosa, prominente, subtus costa incrassata prominente; petiolo canaliculato, limbo 6–7plo breviore: racemis axillaribus, vel pluribus congestis et terminalibus, folio brevioribus; rachi gracili, angulata, pruinosa; bracteis oblongis, deciduis; pedicellis recurvatis et verrucoso-torosis; sepalis quam his longioribus, inæqualibus, pruinosis, oblongis, obtusis, carinatis; ovario semiinfero, 4-loculari, loculis pluriovulatis, vertice convexo; stylo longiusculo. In Cayenne (*Martin*): ***non vidi.***

Berg states that this species is near *L. corrugata*, Poit.; but as its ovary is 4-locular, this position cannot be accepted: it is also said to be near *L. salebrosa*, Berg, differing in its leaves being obtuse at base, in the smooth vertex of its ovary, and oblong sepals: the leaves are 3–5 in. long, 1¼–2 in. broad, on a petiole 6–7 lines long; rachis of raceme 1½–2½ in. long; bracts 2 lines long; pedicels 3 lines long; sepals 3 lines long, 1½–2 lines broad.

40. Lecythis rubicunda, nob.: ramulis pallide brunneis vel griseo-opacis, striolatis, lenticellis verruculosis; foliis ovatis, vel oblongis, imo obtusis, et in petiolum breviter ac subito acutioribus, apice in acumen acutum, aut obtusulum, subrecurvum repente

attenuatis, subintegris, vel margine tenui vix revoluto leviter crenato-serrulatis, rigide chartaceis, supra opacis, sub lente minute granulosis; nervis adscendenter divaricatis, vix prominulis, costa tenui, subtus rubescentibus, opacis, costa valida striata, nervis venisque areolatim reticulatis prominentibus, petiolo fusco, tereti, subcanaliculato, subtus ruguloso, limbo 12–17plo breviore: panicula e racemis 3–4 approximatis, axillari vel terminali; rachi subflexuosa, folio breviore, angulato-sulcata, fusca, granulatim pruinosa, subapproximatim nodosa; floribus ad nodos articulatis; pedicellis sepalis dimidio brevioribus, sæpe recurvulis, subtenuibus, verruculosis; sepalis elongato-oblongis, intus concavis, extus subcarinatis, gibbosis et torulosis, opacis, margine membranaceo-crenulatis; petalis ovatis, unguiculatis; ovario infero, extus verruculoso, 4-loculari, ovulis paucis, paululo sub apicem axi suspensis, vertice concavo, radiatim striato; stylo longiusculo, subincurvo. In Guiana Batava: *v. s. in herb. Mus. Brit.*, Guiana (*Martin*); *in herb. Hook.*, Surinam (*Hostman*, 1260).

This is a tree with white flowers. The species differs from *L. Martini* in its leaves being double their size, and upon shorter petioles, in a paniculate raceme double the length, and with a stouter rachis. The axils of its branchlets are $1\frac{3}{4}$–$2\frac{1}{2}$ in. apart; its leaves are 3-$8\frac{1}{4}$ in. long, $1\frac{1}{4}$–3 in. broad, on a petiole 3–5 lines long, and they have 12-14 pairs of nerves, with others shorter and intermediate, all anastomosing; the panicle or raceme is 2-$3\frac{1}{2}$ in. long; the pedicels 1 line long; the sepals 2 lines long; the petals 7 lines long, 3–4 lines broad; androphorum 9 lines in diam.

41. LECYTHIS SETIFERA, nob.: ramulis tenuibus dichotomis; foliis suborbiculatis, imo petiolum versus abrupte acutis, apice in acumen lineare subito constrictis, membranaceis, denticulatis, dentibus setiferis, supra viridibus, opacis, subtus vix pallidioribus, opacis, costa nervisque tenuibus paullo prominulis; petiolo tenui, subcanaliculato, limbo quintuplo breviore: floribus axillaribus, solitariis; pedicello sepalis paullo longiore; sepalis obtuse ovatis, expansis; petalis triplo longioribus, oblongis; androphori appendiculis longiusculis, fere omnibus antheriferis; ovario infero, turbinato, 4-loculari, vertice vix elevato, radiatim striato; stylo brevi, obtuso. In Brasilia: *v. s. in herb. Hook.*, Rio de Janeiro (*Glasiou*).

A very distinct species, remarkable for the setiferous teeth of its leaves; the axils of its branchlets are $\frac{3}{4}$–1 in. apart; the leaves are $1\frac{7}{8}$–$2\frac{1}{2}$ in. long, $1\frac{1}{2}$–2 in. broad (including their suddenly acute point $\frac{1}{2}$ in. in length, and $1\frac{1}{2}$–2 lines broad), on petioles 3 lines long. The pedicels are 4 lines long, each bearing a single flower; the calyx expanded is 9 lines in diameter; the sepals 2 lines long, 3 lines broad at the base; the corolla expanded is $1\frac{1}{2}$ in. across; the androphorum 9 lines wide.

Species non satis nota.

42. LECYTHIS SUBBIFLORA, R. & P. Fl. Per. iv. tab. 461, ined.; Don, Dict. ii. 873: foliis oblongo-lanceolatis, acuminatis, integris, petiolatis; pedicellis sæpius binis, 1-floris; petalis obtusis, Peru (*non vidi*).

Of this plant nothing more is known, the drawing of Ruiz and Pavon not being accessible in this country; it is therefore impossible to say to which genus this species should be referred.

Species exclusæ.

Lecythis acuminatissima, Berg . . = Eschweilera acuminatissima *.
—— *albiflora*, DC. . . . . = Eschweilera albiflora *.
—— *amara*, Aubl. . . . . = Chytroma amara *.
—— *angustifolia*, Berg . . . . . = Eschweilera angustifolia, *Mart.*
—— *basizone*, Berg . . . . . = Chytroma idatimon *.
—— *Blanchetiana*, Berg . . . . = Eschweilera Blanchetiana *.
—— *bracteata*, Willd. . . . . = Couroupita Guianensis, *Aubl.*
—— *bracteosa*, Pöpp., Berg . . . = Eschweilera bracteosa *.
—— *chartacea*, Berg . . . . . = Chytroma chartacea *.
—— *compressa*, Vell. . . . . = Eschweilera compressa *.
—— *cordata*, Berg . . . . . = Eschweilera cordata *.
—— *coriacea*, DC. . . . . = Jugastrum coriaceum *.
—— *corrugata*, Poir. . . . . = Eschweilera corrugata *.
—— *elegans*, Berg . . . . . = Eschweilera elegans *.
—— *fagifolia*, Berg . . . . . = Allantoma fagifolia *.
—— *grandiflora*, Benth. (non Aubl.) = Lecythis venusta *.
—— *grandifolia*, Berg . . . . . = Chytroma grandifolia *.
—— *idatimon*, Aubl. . . . . = Chytroma idatimon *.
—— *idatimonoides*, Berg . . . . = Eschweilera idatimonoides *.
—— *lævifolia*, Griseb. . . . . = Eschweilera lævifolia *.
—— *lanceolata*, Berg (non Poir.). . = Lecythis biserrata *.
—— *longipes*, Poit. . . . . = Eschweilera longipes *.
—— *longipes*, Benth. (non Poit.) . . = Eschweilera lutea *.
—— *longipes*, DC., var. *platycarpa* . = Eschweilera platycarpa *.
—— *Luschnathii*, Berg . . . . . = Eschweilera Luschnattiana *.
—— *lutea*, Aubl. . . . . = Eschweilera lutea *.
—— *macrophylla*, Berg . . . . . = Eschweilera macrophylla *.
—— *Marawyensis*, Berg . . . . = Chytroma Marawyensis *.
—— *Martiana*, Berg . . . . . = Couratari Martiana *.
—— *micrantha*, Berg . . . . . = Eschweilera micrantha *.
—— *minor*, Vell. (non Jacq.) . . . = Lecythis tuberculata *.
—— *monosperma*, Berg . . . . . = Chytroma monosperma *.
—— *multiflora*, Smith . . . . . = Allantoma multiflora *.
—— *nana*, Berg . . . . . = Eschweilera nana *.
—— *Nicaraguensis*, Moç. & Sess. . = Couroupita Nicaraguensis, *DC.*
—— *obversa*, Berg . . . . . = Eschweilera obversa *.
—— *odora*, Pöpp. . . . . = Eschweilera odora *.
—— *odoratissima*, Salzm. . . . . = Eschweilera Blanchetiana.

Lecythis ollaria, Vell. . . . . = Lecythis Velloziana *.
—— *ollaria*, Sald. . . . . = Lecythis biserrata *.
—— *ollaria*, Hook. . . . . = Lecythis usitata *.
—— *ovalifolia*, DC. . . . . = Chytroma ovalifolia *.
—— *ovata*, Camb. . . . . = Eschweilera ovata, *Mart.*
—— *ovata*, Berg, var. *acuminata* . = Eschweilera acuminata *.
—— *ovata*, Berg, var. *laurifolia* . . = Eschweilera laurifolia *.
—— *ovata*, Berg, var. *obscura* . . = Eschweilera gracilis *.
—— *ovata*, Berg, var. *ovalifolia* . . = Eschweilera Blanchetiana *.
—— *pachysepala*, Spruce et Berg . = Eschweilera pachysepala *.
—— *paniculata*, Berg . . . . . = Eschweilera paniculata *.
—— *parviflora*, Aubl. . . . . = Eschweilera parviflora *.
—— *parviflora*, Sagot . . . . . = Eschwellera Sagotiana *.
—— *parvifolia*, Mart. . . . . = Eschweilera parvifolia *.
—— *pedicellaris*, DC. . . . . = Eschweilera verruculosa *.
—— *pilosa*, Pöpp. . . . . = Eschweilera pilosa *.
—— *platycarpa*, Poit. . . . . = Eschweilera platycarpa *.
—— *Poiteaui*, Berg . . . . . = Jugastrum Poiteaui *.
—— *retusa*, Spr. et Berg . . . . = Chytroma retusa *.
—— *Riedelii*, Berg . . . . . = Eschweilera Riedelii *.
—— *rorida*, Spr. & Berg . . . . = Chytroma rorida *.
—— *rosea*, Berg . . . . . = Chytroma rosea *.
—— *salebrosa*, Berg . . . . . = Chytroma salebrosa *.
—— *schomburgkiana*, Berg . . . = Chytroma Schomburgkiana *.
—— *Siberiana*, Berg . . . . . = Eschweilera Siberiana *.
—— *Spruceana*, Berg . . . . . = Chytroma Spruceana *.
—— *subglandulosa*, Berg . . . . = Eschweilera subglandulosa *.
—— *tenax*, Moritz & Berg . . . . = Eschweilera tenax *.
—— *tenuifolia*, Berg . . . . . = Eschweilera tenuifolia *.
—— *turbinata*, Berg . . . . . = Chytroma turbinata *.
—— *verruculosa*, Berg . . . . . = Eschweilera verruculosa.
—— *Wullfschlægelii*, Berg . . . = Eschweilera macrophylla *.
—— *Zabucayo*, Hook. & Spruce (non Aubl.). = Lecythis usitata *.

5. Chytroma. (Plate XXXIV. B.)

The differences between this genus and *Lecythis* having been amply described in p. 164, it only remains to give the following diagnosis :—

Chytroma, nob.: *Lecythis*, in parte, auct. *Calyx* adnatus, limbo in *sepala* 6–8 diviso. *Petala* 6–8, multo majora, sæpius inæqualia, valde imbricata, unguibus inter discum et androphorum agglutinatis. *Androphorum* ut in *Lecythide*, sed galeæ appendiculæ anantheræ. *Ovarium* semiinferum, turbinatum, vertice intra discum planum elevato, 4-loculare; *ovula* in quoque loculo pauca, sessilia, e basi erecta, anatropa; *stylus* brevissimus, obtusus; *stigma* minimum, subglobosum, papillosum. *Pyxidium*

mediocre, vel parvum, turbinatum, supra vel circa medium *zona calycari* sublineari cinctum; *vitta interzonali* altitudine varia; *zona* superiore orbiculari; *operculo* circulari, mox solubili et deciduo, supra convexo et sæpe umbonato, subtus valde concavo, sine columellæ vestigio, dissepimentis submembranaceis intus signato, cum *velario* intra marginem prope faucem paullo descendente munito; *pericarpio* (operculoque) subtenuiter coriaceo, 4-loculari, dissepimentis membranaceis, sæpe persistentibus. *Semina* in quoque loculo 1–3, sicca, ovata, rarius per pressionem obtuse angulata, utrinque rotundata, levia, erecta, *hilo* majusculo basali affixa: *testa* crustacea (sæpe *arillo* mucilaginoso tecta?), *raphe* ab hilo ad apicem faciei ventrali adscendente, valde compressa et loriformi, lateribus liberis, nervo longitudinali solummodo ad testam adhæsa, cum ramis aliis longitudinalibus, sæpe furcatis, elevatis signata; *integumentum internum* membranaceum; *embryo* conformis, exalbuminosus, homogeneus, fuscus, cerco-carnosus, amarus, *neorhiza* interna *exorhiza* externa undique cincta sistens (cotyledonibus nullis visibilibus).

Arbores *frondosæ Americæ Meridionalis*, habitu *Lecythidis*.

1. Chytroma Schomburgkiana, nob.: *Lecythis Schomburgkii* Berg, in Linn. xxvii. 456: ramulis cinereo-brunneis, rugulosis, interrupte striato-sulcatis, cortice subtransversim rimoso, pruinosis, obsolete verruculosis; foliis ovatis, utrinque rotundatis, sæpe in acumen brevissimum abrupte canaliculatim recurvatis, rigide chartaceis, marginibus cartilagineis revolutis, integerrimis, supra læte vel pallide viridibus, lævibus, subopacis, nervis tenuibus subimmersis, sub lente creberrime foveolato-reticulatis, costa subprominula, subtus pallidioribus, opacis, costa nervisque prominulis; petiolo superne plano, marginato, limbo 10–12plo breviore: racemis axillaribus et terminalibus, folio subæquilongis, aut simplicibus vel pluribus congestis; pedicellis recurvis, alabastro brevioribus, sulcatis, pruinosis; sepalis obtuse oblongis, extus granulosis, carinatis, pruinosis, marginibus late membranaceis, ciliolatis; petalis inæqualibus, obovato-oblongis, apice rotundatis, membranaceis; ovario infero, turbinato, granuloso, 4-loculari, ovulis in quoque loculo 3, e basi erectis, vertice intra discum valde concavo, radiatim striato; stylo tereti, sepalis dimidio breviore; stigmate parvo, papilloso: pyxidio cylindrico, subovato, longe supra medium zona calycari e sepalis dilatatis adpressis linea nexis cincto; vitta interzonali subangusta, fere verticali, diametri 5tam partem alta; zona superiore circulari, integra; operculo pulvinato valde depresso, superne late concavo, subtus concavo et 4-septato, sine columella, cum velario intra faucem longius dependente, 4-loculari, dissepimentis membranaceis, persistentibus, loculis æqualibus, singulis 2-spermis; pericarpio ligneo-coriaceo, non crasso, rufescenti-brunneo, areolis pallidis impressis granulosis maculato; seminibus ovatis, angulato-compressis, imo erectim affixis, collateralibus, fusco-brunneis, raphe loriformi ad angulum ventralem ab hilo basali majusculo ad apicem adscendente dehinc iterum in ramis elevatis descendentibus signato; testa crassa, coriacea, embryone immaturo submarcido, corrugato. In Guiana Brit.: *v. pl. s. in herb. variis*, Guiana (*Schomb.* 458, 792); *v. fr. sicc. in Mus. Kew.* (*Schomb.*).

The above fruit is marked "Schomburgk" in Mr. Bentham's handwriting; and I have no hesitation in referring it to this species rather than to Schomburgk's other Guiana specimen (*C. chartacea*), because of the peculiar hollow summit of the operculum, which agrees in this respect with the hollow vertex of the ovarium, quite an

unusual occurrence. Berg states that the ovary is 3-celled, probably a typographical error, as I have found it constantly 4-celled, with erect ovules. The axils of the branchlets are $\frac{3}{4}$–1 in. apart; the leaves are $2\frac{3}{4}$–$3\frac{1}{4}$ in. long, $1\frac{3}{4}$–2 in. broad, on a petiole 3 lines long, and with about 10 pairs of nerves, with others shorter and intermediate; the rachis of the raceme is 2–$2\frac{1}{2}$ in. long, with prominent nodes 2–3 lines apart; pedicels 1 line; sepals 2 lines long, $1\frac{1}{2}$ line broad; larger petals 9 lines long, 6 lines broad; androphorum 6 lines in diam.; the pyxidium (Plate LVIII. figs. 1 & 2), of a humming-top shape, is $2\frac{3}{4}$ in. long, $2\frac{1}{4}$ in. broad at the calycary zone, which is $1\frac{7}{8}$ in. above the base, and is formed of the almost unchanged sepals united by a line; the interzonal band is 5 lines high; the upper entire zone is 2 in. in diam.; the pulvinate operculum, of similar diameter, is 4 lines high, is broadly concave above, concave and septate beneath, with a velarium descending 4 lines within the mouth; the pericarp is $2\frac{1}{2}$ lines thick, is divided by thin membranaceous dissepiments, continuous with those of the operculum, subsequently ruptured to allow the escape of the seeds. This contains 8 erect seeds, which are immature, erect and shrivelled.

2. Chytroma chartacea, nob.: *Lecythis chartacea*, Berg in Linn. xxvii. 450: ramulis teretibus, opace vel glauco-brunneis, interrupte striatis; foliis ovatis, imo rotundatis et in petiolo late decurrentibus, apice in acumen breve obtusulum vel acutum canaliculatim recurvum repente constrictis, integris, vel ad marginem cartilagineum revolutum punctis fuscis obsolete crenulato-serrulatis, chartaceis, supra subopacis, nervis tenuibus, patule divaricatis, paullo prominulis, valde reticulatis, subtus pallidioribus, brunnescentibus, opacis, costa prominente, nervis venisque prominulis; petiolo subtenui, late sulcato, marginato, limbo 12plo breviore: paniculis terminalibus et axillaribus, pauciramosis, aut racemis axillaribus folio brevioribus; rachi angulata, flexuosa, nodosa, 6–12-flora; pedicellis brevibus; sepalis oblongo-ovatis, subimbricatis, fuscis, extus punctis minutis albidis scabridulis, margine membranaceo ciliolatis; petalis ovatis, concavis, rubris, marginibus fimbriato-ciliatis; androphoro globoso, luteo; ovario semiinfero, pilis brevissimis scabridulo, distincte 4-loculari, ovulis in quoque loculo pluribus, e basi erectis et radiantibus, vertice conico, striato; stylo subbrevi. In Guiana Brit.: *v. s. in herb. Hook.*, Pomeroon (*Schomb.* 791, 1432).

A species certainly congeneric with *C. Schomburgkianum*, from which it differs in its less coriaceous leaves, its scabridulous sepals with a narrower membranaceous border, in its red petals, and conical vertex of the ovary. The axils of its branchlets are 1–$1\frac{1}{2}$ in. apart; the leaves are 2–4 in. long, $1\frac{1}{4}$–$2\frac{1}{4}$ in. broad, on a petiole 2–4 lines long; they have about 12 pairs of nerves, with others shorter and intermediate; the rachis of the raceme is $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, the pedicels $\frac{1}{2}$ line long, the sepals 2 lines long, the petals 9 lines long, the flower in bud 4–5 lines in diameter.

3. Chytroma amara, nob.: *Lecythis amara*, Aubl. Pl. Guian. ii. 718, tab. 286–285 a, fig. 1–4; DC. Prodr. iii. 292; Berg in Linn. xxvii. 453: ramulis teretibus, fusco-

brunneis, opacis, lenticellis flavidis verruculosis, striatis; foliis elongato-oblongis, vel ellipticis, imo obtusis et subito acutatis, apice in acumen acutum constrictis, subintegris, vel ad marginem cartilagineum revolutum obsoletissime serrulatis, subcoriaceis, supra sublucentibus, nervis tenuibus subimmersis patule divaricatis, venis creberrime reticulatis, ad costam prominulam sulcatis, subtus pallidioribus, sæpe rubentibus, nervis venisque favoso-reticulatis prominulis, costa validiore prominente; petiolo fusco, canaliculato, marginato, subruguloso, limbo 12plo breviore: racemis terminalibus, sæpe axillaribus, folio multo brevioribus; rachi ferrugineo-pruinosa, angulata, interrupte striata, nodosa; bracteis majusculis concavis, margine ciliatis, caducissimis; floribus subparvis; pedicellis tenuibus, corrugatis; sepalis 6, his duplo longioribus, oblongo-ovatis, pruinosis, crassiusculis, carinatis, ciliatis; petalis 6, ovatis, duplo majoribus, concavis, flavis; ovario fere omnino supero, imo brevissime turbinato, cum pedicello toruloso, distincte 4-loculari, ovulis in quoque loculo 2 e basi erectis, vertice valde elevato, conice convexo, flavimaculato, lævi; stylo brevi, obtuso: pyxidio oviformi, paullo infra medium zona calycari e sepalis persistentibus 6 incrassatis subdivergentibus linea nexis cincto; vitta interzonali introrsum suberecta, diametri fere dimidiam partem alta; zona superiore integra, quam inferior paulo minore; operculo orbiculari, subhemisphærice convexo, apice breviter umbonato, intus concavo, cum velario intra faucem dependente, et dissepimentis 4 (sine columella) ruptis diviso; pericarpio coriaceo, subcrasso, intus 4-locular, dissepimentis submembranaceis; seminibus in quolibet loculo solitariis, erectis, oblongis, ventre subangulatis. In Guiana: *v. s. pl. in herb. Mus. Brit.*, Cayenne, in sylvis (*Aublet*); *in herb. Hook.*, Guiana (*Talbot*) : *fr. non vidi.*

A species very near the preceding, differing in its much larger, more elongated leaves, and its more ovoid fruit. It is a tree of considerable size, with a copious head and a thick trunk, bare for the height of 10 feet. The axils of its branchlets are $\frac{3}{4}$–1 in. apart; the leaves are 4–7$\frac{1}{2}$ in. long, 1$\frac{3}{4}$–2$\frac{1}{2}$ in. broad, on a petiole 5–7 lines long, with about 16 pairs of parallel very divergent nerves, with others shorter intermediate, all anastomosing. By the fall of the upper leaves, the axillary racemes often assume a panicular form; the rachis is 1$\frac{1}{2}$–2$\frac{3}{4}$ in. long, with nodes 3–5 lines apart; pedicel 4 lines long; sepals 1$\frac{1}{2}$ line long; petals 4 lines long, 3 lines broad; upper moiety of ovary above disk 1$\frac{1}{2}$ line high; style 1$\frac{1}{2}$ line long; the pyxidium (Plate LVIII. figs. 8, 9) is 3 in. long, 2$\frac{1}{2}$ in. broad at the calycary zone, which is 1$\frac{1}{4}$ in. above the base; the interzonary band is nearly 1 in. high; the entire upper zone 1$\frac{3}{4}$ in. in diam.; the operculum, of the same breadth, is 8 lines high, concave within, with a velarium descending 4 lines within the mouth; the membranous dissepiments persist, both in the lower portion and in the operculum; the pericarp and operculum are rather thin in substance, and somewhat fragile; the seeds are very bitter, as in all other species of this genus.

4. Chytroma incarcerata, nob.: planta ignota: pyxidio filiformi, depresse globoso, paulissime sub apicem zona calycari e sepalis acutis vix prominulis linea nexis cincto; vitta interzonali introrsum acclivi, diametri octavam partem alta; zona superiore orbiculari, margine acuta, quam inferior minore; operculo subhorizontali,

summo paullulo concavo, medio breviter umbonato, inferne concavo, dissepimentis 4 tenuibus diviso, cum velario late extrorsum expanso, ore multo latiore, et hinc ad maturitatem soluto, tamen inextricabili ; pericarpio subtenui pallide brunneo, rugulose scrobiculato, 4-loculari, dissepimentis membranaceis persistentibus : seminibus majusculis, in loculis solitariis, ovalibus, ventre subangulatis, hilo basali affixis ; testa lævi, fulva, pergaminea, raphe ventrali late loriformi flavida, cum ejus ramis e basi adscendentibus ; embryonis structura generis. In Brasilia : *v. fr. s. in Mus. Brit.* (sine loco).

From this singular development of the fruit the operculum and seeds remain imprisoned after the period of maturity; for though the velarium becomes detached from the pericarp, the operculum, not being able to fall outward, is drawn inward by the desiccation of the dissepiments; except for this peculiarity there would be little to distinguish it from the fruit of *C. cistella* except its smaller vertex and more depressed form. The pyxidium (Plate LVIII. figs. 3, 4) is 2 in. long, $2\frac{5}{8}$ in broad; the calycary zone is $1\frac{7}{8}$ in. in diam., and $1\frac{3}{4}$ in. above the base; the interzonal band is $\frac{1}{4}$ in. high; the upper zone $1\frac{1}{4}$ in. in diam.; the tightly fitting operculum is of the same diameter, and does not rise above the zone, is slightly concave and umbonate at the summit, is of thin texture, concave below, with the thin dissepiments attached to it; but its velarium expands outwardly at a considerable angle, and descends half an inch below the mouth, at first attached to the pericarp; but after maturity it there becomes detached, when by the shrinking of the dissepiment the operculum is drawn inwards, as above explained; the pericarp is about $1\frac{1}{2}$ line thick at the sides, $\frac{3}{8}$ thick at the bottom, where it is suddenly swollen; the seeds are $1\frac{1}{2}$ in. long, 1 in. broad.

5. Chytroma cistella, nob.; *Lecythidis* sp., Spruce in Hook. Kew Journ. v. 239. n. 69 : planta ignota : pyxidio poculiformi, imo globoso, longe supra medium zona calycari sursum acutiuscula undulato-lineari cincto ; vitta interzonali valde angusta, suberecta ; zona superiore circulari, integra, inferiore vix minore ; operculo brevissimo, depresse pulvinato, late concavo, subtus concavo et 4-septato, sine columella, cum velario dissepimentis continuo longe intra faucem descendente ; pericarpio crasso, leviter lignoso, cortice tenuiter suberoso, rimoso, brunneo, granulato vel scrobiculato-ruguloso, obsolete 4-loculari, intus imo cicatricibus hilorum signato. In Brasilia, prov. Amazonas : *v. f. s. in Mus. Kew.* (*Spruce*, 69, 233).

There are 3 specimens of this fruit in the Kew Museum, which I have referred to this genus, on account of the cicatrices of the attachment of the seeds. It is shown on Plate LVIII. figs. 6, 7, where the height from the base to the upper zone is $2\frac{1}{4}$ in.; the diam. at the middle is 3 in., that of the calycary zone $2\frac{3}{4}$ in.: that of the upper zone $2\frac{3}{8}$, contracted at the inner mouth to a breadth of $1\frac{3}{4}$ in.; the interzonary band is 3 lines high; the operculum is $3\frac{1}{4}$ in. in diam., only 2 lines high, depressed in the centre, hollow within, where it is 4-celled, with a velarium descending 5 lines within the mouth; the pericarp is $\frac{3}{8}$ in. thick; the mouth below the upper zone is $1\frac{3}{4}$ in. broad, the inner diameter $2\frac{1}{4}$ in. and its depth $1\frac{7}{8}$ in. It resembles the fruit of *C. Schomburgkianum* in its

short very depressed operculum; but it differs in its quite orbicular form, with a pericarp of twice its thickness. The tree from which these fruits were obtained is very lofty, growing in the forests near the Barra do Rio Negro.

6. CHYTROMA TURBINATA, nob.: *Lecythis turbinata*, Berg in Mart. Fl. Br. *l. c.* 493, tab. 73 (icon. fruct. distort.): *Lecythis*, sp., Spruce in Hook. Kew Journ. v. 170, no. 4: ramulis pallide et opace brunneis, ramosis, rugosis, substriatis, lenticellis verruculosis; foliis majusculis, elongato-oblongis, imo in petiolum sensim acutis, apice in acumen sublineare longum acutissimum subito attenuatis, integris, vel ad marginem cartilagineum subrevolutum punctis obsoletissime serratis, rigide chartaceis, supra pallide viridibus, opacis, nervis tenuissimis vix prominulis, costa tenui carinata prominente, subtus pallidioribus, fulvo-opacis, costa crassa pruinosa, nervis flavidis venisque prominentibus; petiolo valido, canaliculato, marginato, subtus corruguloso, limbo 16–20plo breviore: racemis terminalibus et axillaribus, folio multo brevioribus; rachi nodosa, circ. 10–14-flora; pedicellis subtenuibus; sepalis oblongis, crassiusculis, persistentibus; ovario 4-loculari: rachi fructifera incrassata, flexuosa, valde nodosa, pruinosa: pyxidio globoso, imo hemisphærico, sæpe gibboso et difformi, circa medium zona calycari e sepalis 6 linea nexis cincto; vitta interzonali subacclivi convexa, diametri sextam partem alta; zona superiore quam calycaris paullo minore, circulari; operculo isti conformi, quam vitta fere triplo altiore, valde convexo, obtuse umbonato aut sublævi, subtus valde concavo, cum velario intra faucem descendente; pericarpio coriaceo pallide brunneo, subrugoso, lenticellis granosis flavis maculato, primum 4-loculari (aut abortu 1–2-loculari), sicco dissepimentis evanidis pseudo-1-loculari et 4-spermo (aut abortu 1-spermo); seminibus uniseriatim imo affixis, ovatis, dorso convexis, ventre subangulatis, testa lævi, flavescente, raphe ad angulum ventralem lata, ramis linearibus furcatis. In Amazonas: *v. pl. s. in hb. variis*, Barra do Rio Negro (*Spruce*, 1167, cum fruct. distort.); *in hb. Hook.*, Barra (*Spruce*, 1238); cum fruct. normal. in Mus. Kew. (*Spruce*, 1238); etiam Rio Arepicurú (*Spruce*), sine numero.

This very distinct species belongs certainly to this genus, and not to *Lecythis*, because of its fruit and seeds. Berg's drawing of the monospermous fruit is correct and like that of my own specimen (Spruce, 1167); but these are of abnormal growth, 1-locular by the abortion of the other cells, and, in consequence, of a very gibbous form. The second specimen of the plant (Spruce, 1268) has a note attached to it, saying that the fruit is sent separately; and accordingly we see in the Museum at Kew a fruit marked with that number, so that no doubt can exist as to their identity. It is quite similar to another collected at Rio Arepicurú by Spruce, and is one of the kind called *Macacarecuya* (Monkey-cups) by the natives.

The species forms a low tree, much branched, growing in the Iguarapés (inundated lands) of the rivers; the axils of the branches are $\frac{3}{4}$–$1\frac{1}{4}$ in. apart; the leaves are 7–$9\frac{1}{2}$ in. long (including the narrow acumen 1 in. long), and $1\frac{3}{4}$–3 in. broad, on a petiole 5–6 lines long; and they have about 12 pairs of nerves, with others intermediate anastomosing with them; the rachis of the racemes is slightly flexuous, $1\frac{1}{2}$ in long, with 10–12 pro-

minent floriferous nodes, 2–3 lines apart. The pyxidium (Plate LIX. figs. 9 & 13) is $1\frac{3}{4}$–2 in. long; the calycary zone, 9–10 lines above the base, is 2–$2\frac{1}{2}$ in. in diam.; the interzonal band is 4–5 lines high: the upper zone and operculum are $1\frac{3}{4}$ in. in diam., the latter 6 lines high, depressed on the summit, without an umbonate point, which is seen only on the imperfect fruit; it is quite hollow within, with the traces of 4 evanescent dissepiments, and furnished within its margin by a velarium which descends 4 lines within the mouth; the pericarp is 2 lines thick, showing inside the indications of the withered dissepiments; the 4 erect seeds are 1 inch long, 10 lines broad, yellowish, subpolished, marked with the veins of the raphe as in the foregoing species. The single seed in the abnormal fruits is similar in size and shape to the above, and is marked in the same way.

In a note attached to the specimen of the fruit, Spruce states that "when gathered it had an exceedingly aromatic arillus, which the ants speedily devoured." We may presume this "arillus" covered the testa; but no trace of it now exists.

7. Chytroma Spruceana, nob.: *Lecythis Spruceana*, Berg (in parte) in Mart. Flor. Bras. *l. c.* p. 487: ramulis fusco-brunneis, subflexuosis, profunde et interrupte sulcatis, obsolete verruculosis; foliis ovatis, vel oblongo-ovatis, imo obtusis, et in petiolum acutatis, apice obtusis et in acumen sæpe angustum longe cuspidato-mucronatum subito constrictis, chartaceis, ad marginem revolutum et undulatum obsolete crenato-serrulatis, supra opace sublucidis, minutissime granulatis, nervis tenuibus parallele divergentibus et longe adscendentibus subimmersis, reticulatis, costa prominula, subtus subochraceo-pallidioribus, opace pruinosis, nervis flavidis prominentibus, venis prominulis, costa striolata prominente; petiolo fusco, canaliculato, marginato, ruguloso, limbo 10plo breviore: panicula terminali, pluriramosa; rachi subflexuosa, angulato-sulcata, verruculosa, prominente nodosa: pedicellis ad nodos alternos articulatis, sulcatis; sepalis ovatis, subæqualibus, extus parallele striatis et granulatim punctatis, marginibus erosulis; petalis obovatis, albis (siccis flavis), extus rugulosis; ovario infero, turbinato, 4-loculari, ovulis in quoque loculo 3, e basi distinctissime erectis, vertice intra discum plano, radiatim striato; stylo subulato, incurvo, sepalis breviore: pyxidio subgloboso, medio zona calycari e sepalis 6 lineatim nexis cincto; vitta interzonali suberecta, subconvexa, diametri quintam partem alta; zona superiore integra; operculo vittæ altitudine, supra convexo, intus concavo, vestigiis septorum signato, cum velario intra faucem descendente vitta dimidio breviore munito; pericarpio subcrasso, coriaceo, extus opace brunneo et ruguloso, intus 4-loculari, dissepimentis submembranaceis mox evanidis; seminibus in quoque loculo 2, erectis. In Brasilia: *v. s. in herb. variis*, Panuré, Rio Uahúpes (*Spruce*, 2700): San Carlos, Rio Negro (*Spruce* 3695).

This is a tree 30–50 feet high, growing on the margins of rivers, and bearing white odoriferous flowers; the axils of the branchlets are 1 in. apart; the leaves are $3\frac{1}{2}$–$5\frac{1}{2}$ in. long. $1\frac{3}{4}$–$2\frac{3}{4}$ in. broad, on a petiole 5–6 lines long, and with about 14 pairs of nerves, with others shorter and intermediate: in my specimen the panicle is $3\frac{1}{2}$ in. long, with 1 to 4

lateral branches 2 in. long and 4 lines apart; the nodules on which the pedicels are articulated are ½ line long, 2–3 lines apart; the pedicels 1 line, the sepals are 2 lines long, 1 line broad; the petals 1¾ in. long, 1 in. broad; the androphorum is 1 in. in diam.; the flower expanded 4 in. across; the erect ovules are distinctly fixed at the very base of the axis in the ovary; the immature pyxidium (Plate LIX. figs. 3, 4) is 1½ in. high; the calycary zone is 1½ in. in diam.; the interzonal band 3 lines high; the upper zone and operculum are 1¼ in. in diam.; the latter 6 lines high, concave beneath, and with a velarium descending more than 3 lines within the mouth; the pericarp is 2 lines thick; the seeds were destroyed and agglomerated by caries in all the specimens I have seen.

8. Chytroma Ibiriba: *Ibiribá*, Marcg. & Piso. Hist. Nat. Bras. p. 136: ramulis teretibus, subcinereis lenticellato-verruculosis, cortice subrimoso; foliis oblongo-ovatis, vel oblongis, imo rotundiusculis vel obtusis et in petiolo brevissime decurrentibus, apice in acumen brevissimum acutum vel obtusulum recurvulum abrupte attenuatis, subintegris, aut ad marginem cartilagineum subrevolutum obsolete crenatis, chartaceis vel subcoriaceis, supra pallide viridibus, lævibus, subopacis, nervis divaricatis vix prominulis, costa tenui, striolata, prominula, subtus pallide brunneis, luride opacis, pulverulento-pruinosis, nervis tenuissimis venisque paullo prominulis, costa striata prominente; petiolo canaliculato, striato-rugoso, limbo 15plo breviore: racemo terminali, pauciramoso, folio multo breviore; rachi geniculata, nodosa, crebre 6–10-flora; rachi fructifera pedicellisque incrassatis: pyxidio immaturo subgloboso, sæpe gibboso, utrinque convexo, ad medium zona calycari e sepalis foliaceis auctis linea nexis cincto; vitta interzonali angusta, erecto-convexa, diametri tertiam partem alta; zona superiore circulari; operculo majusculo pulvinatim convexo, umbonato, intus concavo cum velario æque alto intra faucem descendente; pericarpio crasse coriaceo, fusco-brunneo, lenticellis flavidis maculato, scrobiculatim ruguloso, intus 4-loculari, interdum abortione sub-1-loculari; seminibus paucis, oblongis, fuscis, testa crasse coriacea; embryone generis. In Brasilia: *v. s. in hb. Hook.*, Maccio, prov. Alagoas (*Gardner*, 1411); ibidem (*Gardner*, 1312); Bahia (*Sello*): *v. fruct. matur. in Mus. Kew.*, Maccio (*Gardner*).

This is evidently the plant described by Marcgraff as a tree about the height of a pear-tree, growing in Alagoas, where it bears the name of Ibiribá, and where also Gardner found it as a small tree: the axils of its branchlets are 1–1½ in. apart; the leaves are 3½–6½ in. long, 1½–3 in. broad, on a petiole 2–4 lines long, with about 10 pairs of nerves, with others shorter, anastomosing with the veins; the raceme is 2–4 in. long, with nodes 2–3 lines apart; the fructiferous pedicels are 3–6 lines long; the immature pyxidium (Plate LIX. figs. 14, 15) is 10 lines high, 18 lines broad; the calycary zone (formed of 6 patent sepals 2 lines long) is 5–8 lines above the base; the operculum is 15 lines in diam., 6 lines high, concave within, with the remains of a dissepiment, and with a velarium descending halfway down within the mouth of the pericarp; this is rather thick, with a persistent stoutish dissepiment, one cell abortive, narrowish, the other cell containing a single erect seed, with other abortive ovules around the place of its attach-

ment; the immature seed is 10 lines long, 7 lines broad, with a thick coriaceous testa, containing a dark embryo, with an internal neorhiza of a paler colour.

9. Chytroma cincturata, nob.: *Lecythidis* sp., Spruce in Hook. Kew Journ. v. p. 239. n. 67: planta ignota: pyxidio subgloboso, imo brevi, convexo, paullo supra basin zona calycari e sepalis 6 acutis patentibus et linea nexis cincto; vitta interzonali cylindrice suberecta, diametri quartam partem alta; zona superiore orbiculari, integra; operculo fere ejusdem altitudinis, hemisphærice convexo, apice interdum breviter obtuse umbonato, infra concavo, cum velario intra faucem descendente, septi vestigiis signato; pericarpio crassiuscule coriaceo, fusco-opaco, rugoso-scrobiculato, 6-spermo; seminibus ovatis, utrinque rotundatis, ventre subangulatis, dorso convexis, raphe ventrali, late lineari, marginibus liberis, cum ramis prominulis, longitudinalibus, cancellatim furcatis ab hilo adscendentibus. In Amazonas: *v. fr. sicc. in Mus. Kew.*, Barra do Rio Negro (*Spruce*, 67).

This fruit, according to Spruce, belongs to a tree 60–80 feet high, growing in forests near the Barra, furnished with weak branches, too lofty to obtain the leaves. The fruit, called by the natives *Macacarecuya* (Plate LIX. fig. 7), is $1\frac{3}{4}$ in. long, 2 in. broad, the depth below the calycary zone being 5 lines, the interzonary band 7 lines high, the operculum near 2 in. in diam., 8 lines high, the velarium descending 2 lines within the mouth; the seeds are 12 lines long, 8 lines broad, with a coriaceous testa like that of the typical species.

10. Chytroma urceolata, nob.: planta ignota: pyxidio urceolato, imo campaniformi, paullo supra medium zona calycari annulari e sepalis 6 dentiformibus linea nexis cincto; vitta interzonali erecta, diametri quintam partem alta; zona superiore circulari, integra, inferiore æquali; operculo depresse pulvinato, vertice late concavo, intus plane concavo, cum velario subbrevi intra faucem descendente; pericarpio subtenui, intus obsolete 4-loculari; seminibus 4, ovatis, ad faciem ventralem subangulatis, hilo basali affixis, erectis, fusco-brunneis, raphe lata, ventrali, cum lineis aliis longitudinalibus immersis e basi adscendentibus furcatis; embryone generis. In Amazonas, *v. fr. sicc. in Mus. Kew.*, Barra do Rio Negro (*Spruce*).

This is one of the kinds of fruit called by the natives Macacarécuya, or Monkey-cups. The pyxidium (Plate LIX. fig. 5) is $1\frac{3}{4}$ in. long, $1\frac{1}{2}$ in. broad at the calycary zone, which is 13 lines above the base; the interzonary band is 5 lines high and $1\frac{1}{2}$ in. in diameter; the operculum, of the same diameter, is 3 lines high, and precisely of the same shape as that of *C. Schomburgkii*, but thinner in substance, and very different from that of the preceding species: it is broadly concave in the summit, quite hollow inside, with a velarium within the margin descending 2 lines into the mouth; the pericarp is barely $\frac{1}{2}$ line thick, with the vestiges of the dissepiments, which have disappeared (and it contains 4 seeds), 13 lines long, 9 lines broad.

11. Chytroma grandifolia, nob.: *Eschweilera grandiflora*, Mart. obs. 3071; DC. Prodr. iii. 293; *Lecythis grandiflora*, Berg, Fl. Bras. *l. c.* p. 494, tab. 73. fig. 1;

Linn. xxvii. 453: ramulis teretibus, fusco-cinerascentibus; foliis oblongis, vel oblongo-lanceolatis, imo obtuse rotundatis, apice in acumen breve sæpe angustum abrupte attenuatis, integerrimis, vel serraturis obliteratis subundulatis, rigidule chartaceis, supra viridibus, nitidis, nervis plurimis, longe a margine arcuatim nexis, prominulis, reticulato-venosis, subtus costa demum nigrescente nervisque prominentibus; petiolo tereti, canaliculato, limbo 24plo breviore: racemis axillaribus, folio brevioribus; rachi angulata, flavide fuscescente; floribus cum pedicellis validis fere sessilibus: pyxidio turbinato, infra medium zona calycari e sepalis acutis lineatim nexis cincto; vitta interzonali quam diametrus dimidio breviore, erecta et apice subito paullo rotundata; zona superiore circulari, quam inferior paullo angustiore; operculo orbiculari, pulvinato, brevissimo, valde depresso, subumbonato, intus concavo, cum velario brevi intra faucem descendente; pericarpio crassiusculo 2-loculari (?), dissepimento crassiuscule coriacco, persistente, loculis 2-spermis; seminibus oblongis, ventre subangulatis, dorso convexis, erectis, imo affixis. In Brasilia septentrionali ad fluv. Japuré (*Martius*): *non vidi.*

A species much resembling *Eschweilera macrophylla*; but it is a much larger tree, being 50–60 feet high, and differing in several characters, especially in its nearly sessile flowers; the axils of its branchlets are somewhat remote; the leaves are 6–8½ in. long, 1¾–2½ in. broad, on a petiole 3–4 lines long. The pyxidium (Plate LIX. fig. 1) is 2 in. long, the calycary zone 9 lines above the base and 2 in. in diam.; the interzonary band is ⅞ in. high, suddenly narrowed at its mouth into the superior zone 1¾ in. in diam.; the operculum of this breadth is only 2 lines high, or 3 lines at the umbonate summit; the pericarp is 2 lines thick, with a dissepiment of nearly equal thickness; the seeds are 14 lines long, 9 lines thick, fixed by their base, with a thin pergamineous testa, having a raphe of several longitudinal bands, that along the ventral angle being broadest, as in the other species, and obscurely described by Berg, "angulo receptaculo albo carnoso lineari involuto;" the nucleus is of a yellowish colour. There appears to me some mistake in Berg's drawing and description; for in all the other species the dissepiment is thin and membranaceous, rarely persistent, but here it is shown to be as thick as the pericarp itself; and each cell appears again 2-locular in the transverse section, for it can hardly be meant to represent a section of the seeds, because he describes their testa as thin and pergamineous (not thick and coriaceous).

12. Chytroma pilacarpa, nob.: planta ignota: pyxidio subgloboso, imo hemisphærico, infra medium zona calycari lineari 6-denticulata cincto; vitta interzonali erecta, diametri tertiam partem alta; operculo cum zona superiore orbiculari, vitta breviore, primum valde depresso, mox valde convexo, apice lævi, intus concavo, vestigiis septorum 4 signato, cum velario subbrevi intra faucem descendente; pericarpio subtenuiter coriaceo, opaco, fusco, lenticellis flavis verruculoso, cortice tenui subrimoso, obsolete 4-loculari. In Brasilia: *v. s. in Mus. Kew.*, Barra do Rio Negro (*Spruce*, 1452, sub *Swartzia argentea*).

This fruit is 2 in. high, 2 in. broad; the calycary zone 10 lines above the base; the

interzonal band 8 lines high; the operculum nearly 2 in. in diam. and 7 lines high. There is another specimen $2\frac{3}{8}$ in. in diam., both without seeds: the reference on the ticket to Spruce's specimen of *Swartzia argentea* must be a mistake.

The pyxidium (Plate LVIII. fig. 12), from its erect interzonary band, bears a resemblance to that of *Chytroma cincturata*, but is of thinner texture, its operculum is very depressed at first, then gradually rounded in an ogee-form curve.

13. Chytroma monosperma, nob.: *Lecythis monosperma*, Berg in Mart. Fl. Br. *l. c.* p. 485, tab. 67. fig. 2: planta ignota: pyxidio subparvo, ovali, imo obtuse rotundato, paullo sub apicem zona calycari e sepalis 6 acutis depressis linea nexis cincto; vitta interzonali breviuscula, convexa, diametri tertiam partem alta; zona superiore quam inferior minore, orbiculari, integra; operculo ignoto; pericarpio crassiusculo, spongioso-lignoso, granulis parvis flavidis irrorato, vitta lævi, abortu 1-loculari et monospermo, loculis 3 septisque membranaceis ad latus simul detrusis, et ovulis basalibus abortivis instructis; semine loculum fertilem implente, oblongo-ovato, testa duriuscula, castanea, raphe ramisque subplanis ab hilo basali adscendentibus notata. In Brasilia, prov. Pará (*non vidi*).

The pyxidium (Plate LVIII. fig. 10) is remarkable for its egg-like shape: it is 21 lines long, without the operculum, 16 lines broad in the middle; the calycary zone is 16 lines above the base, 15 lines in diam.; the interzonal band is 4 lines high, the upper zone 11 lines across; the pericarp apparently is 2 lines thick; the seed is erect, attached to the base of the cell, 14 lines long, 9 lines broad, covered by a testa resembling that of other species of *Chytroma*, and very different from that of an *Eschweilera*.

14. Chytroma basilaris, nob.: planta ignota: pyxidio pallide brunneo, semigloboso, subquadrato, imo depresso, convexo, corrugulatim scrobiculato, paullo supra basin zona calycari anguste laminiformi obsolete 6-lobata cincto; vitta interzonali paullo elevata, extrorsum valde acclivi; zona superiore quadratim orbiculari, in labium annulare prominens expansa; operculo ista paullo angustiore, altissimo, semigloboso, apice subito umbonato, extus grosse tuberculato-rugoso, crassiusculo, intus concavo, vestigiis septorum 4 signato; velario nullo; pericarpio parte inferiore depresso-pateriformi, crassiusculo, extus grosse rugoso, obsolete 4-loculari, 8-spermo. In Guiana Brit.: *v. s. in Mus. Kew.*, Demerara (*Parker*).

This pyxidium (Plate LVIII. fig. 13) is of a very unusual form, extremely different from all others; it is $1\frac{3}{8}$ in. high; the calycary zone is $1\frac{1}{4}$ in. in diam., only 2 lines above the base; the interzonal band, extrorsely cup-shaped, is 3 lines high; the annular lip-shaped projecting rim of the upper zone is $2\frac{1}{8}$ in. in diam., the opercular mouth being $1\frac{5}{8}$ in. broad: the operculum is in the form of a lofty dome, is somewhat 4-gonous at the base, where it is 2 in. across the angles and $1\frac{3}{4}$ in. across the intermediate lines of the dissepiments; it is about 11 lines high, 6 lines deep inside, and $2\frac{1}{2}$ lines thick; the depth of the internal cavity of the lower portion is 2 lines.

15. Chytroma Idatimon, nob.: *Lecythis Idatimon*, Aubl. Pl. Gu. ii. 721, tab. 289;

DC. Prodr. iii. 291 (excl. syn.); Berg in Linn. xxvii. 453: *Lecythis basizone*, Berg in Mart. Fl. Br. *l. c.* p. 617: arbor magna, ramulis teretibus, cinereo-brunneis, obsolete striatis, subverruculosis; foliis oblongis, imo obtusis, apice in acumen obtusum subbreve subito attenuatis, margine subrevoluto obsolete crenato-serratis, rigide chartaceis, supra fusco-viridibus, subnitentibus, vel subopacis, nervis tenuibus, subpatentibus, semiimmersis, creberrime reticulatis, costa tenui, subtus opacis, cinnamomeis vel hepatice ferrugineis, nervis venisque flavidis paullo prominulis, costa prominente, nitida; petiolo profunde sulcato, marginato, subtus corrugulato, limbo 15plo breviore: recemis axillaribus, brevissimis; rachi flexuosa, valde verruculosa, nodosa; floribus approximatis, subparvis; pedicellis calyce longioribus, validis, rubris, lenticellis albis verruculosis; sepalis acute ovatis, rugulosis; petalis subinæqualibus, ovatis, concavis, imbricatis, incarnatis: pyxidio parvo, subgloboso, imo turbinato; paullo supra basin zona calycari annulari e sepalis reflexis 6-lobata cincto; vitta interzonali erecte subconvexa, diametri 4tam partem alta; zona superiore integra; operculo alte convexo, umbonato, intus concavo, 4-septato, cum velario latiusculo intra faucem dependente; pericarpio crustaceo-coriaceo, 4-loculari, dissepimentis membranaceis sistentibus; seminibus in quolibet loculo solitariis, ventre angulosis, nervosis, amaris. In Guiana: *v. s. pl. in herb. Mus. Brit.*, Cayenne (*Aublet*) (*fructum non vidi*).

The fructiferous specimen collected by Poiteau in Guiana, and called by Berg *L. basizone*, is evidently identical with Aublet's plant. The same species is said to grow in Trinidad, where it is called *Guaticari*; in Cayenne it is known by the name *Idatimon*. Its trunk is 60 feet high, with a branching head; the axils of its branchlets are $\frac{3}{4}$ in. apart; the leaves are 5–5$\frac{3}{4}$ in. or more long, 1$\frac{3}{4}$–2 in. broad, on a petiole 4–5 lines long, and with about 18 pairs of nerves, with others shorter intermediate, all anastomosing; the rachis of the raceme is 1$\frac{1}{2}$–2 in. long; the pedicels, curved and deflected, 4 lines long; the sepals 3 lines long; the petals about $\frac{1}{2}$ in. long; the pyxidium (Plate LIX. fig. 17) is 1$\frac{1}{4}$ in. long, 1$\frac{1}{4}$ in. broad; the calycary zone is 1$\frac{1}{4}$ in. in diam., and 6 lines above the base; the interzonary band is about 3 lines high; the upper zone 1$\frac{1}{8}$ in. in diam.; the operculum, of the same breadth, is 6 lines high, with a velarium which descends 3 lines within the mouth.

16. Chytroma salebrosa, nob.: *Lecythis salebrosa*, Berg in Mart. Fl. Bras. *l. c.* p. 488: arborea, ramulis griseis, striatis, verruculosis; foliis sparsis, ovali-oblongis, sæpe complicatis, imo in petiolum angustatis, apice recurvato-acuminatis, marginibus subrevolutis integris, vel obsoletissime serrulatis, utrinque nitidis, concoloribus, nervis erecto-patulis, mox in venis vix tenuioribus prominulis anastomosantibus; petiolo canaliculato, limbo 6–9plo breviore: racemis axillaribus et terminalibus, foliis brevioribus, dense pruinosis; rachi gracili, flexuosa, angulosa; bracteis caducis; pedicellis torosis, recurvis; sepalis parum brevioribus, ovatis, vel ovato-oblongis, obtusis; petalis subrotundis, denticulatis; ovario infero, toroso, 4-loculari, ovulis e basi erectis, vertice radiatim striato; stylo longiusculo. In Guiana Batava, ad colonia Berlyn (*Wellschlegel*, 1472): *non vidi*.

Berg states that this species comes near *L. corrugata* (which belongs to the genus *Eschweilera*): it is nearer *Chytroma Idatimon*, and perhaps does not differ from it specifically. The leaves are 3–6 in. long, 16–28 lines broad, on a petiole 6–8 lines long; the racème is 2–3 in. long, ¾–1 in. broad; the pedicels 2 lines long; the bud 5 lines in diam.; the sepals ¾–2 lines long, ¾–1 line broad; petals 5 lines long; style 1½ line long.

17. Chytroma validA, nob.: ramulis validis, teretibus, pallide brunneis, pruinoso-opacis, subrugosis vel interrupte striolatis, verruculosis; foliis ovalibus, utrinque rotundiusculis, apice brevissime et subito constrictis, marginibus valde undulatis, integris vel obtuse serratis, rigide chartaceis aut subcoriaceis, supra pallidis, opacis, minutissime granulatis, nervis parallele patentibus et sensim incurvatis prominulis, costa sulcata, subtus concoloribus, costa nervis venisque reticulatis prominentibus; petiolo profunde sulcato, late costato-marginato, limbo 9plo breviore: racemis validis, subpaniculatis, terminalibus, foliis brevioribus, aut longioribus; rachi crassa, compresso-angulata, ochraceo-opaca, pruinosa, nodis crassis subapproximatis prominentibus; floribus caducis; pedicellis brevibus, crassis, lenticellato-verruculosis, ad nodos articulatis; sepalis obtuse obovatis, glauco-pruinosis, crassiusculis, marginibus tenuibus laceratis; petalis oblongis; ovario semiinfero, crebre flavido-maculato, verruculoso, 4-loculari, ovulis 4 in quoque loculo basilaribus, vertice intra discum latiusculum conice elevato, et stylo brevissimo umbonato, lenticellis crebre verruculoso. In Nova Granada: *v. s. in herb. Hook.*, inter Plato et Pinto (*Horton*, 929).

This species has much of the habit of a *Couroupita*; the axils of its branchlets are 1 in. apart; the leaves are 6½ in. long, 3½ in. broad, on a thick petiole 9 lines long, 2 lines broad, and they have about 18 pairs of parallel nerves arcuately joined; the racemes are 6-9 lines long, 2–2½ lines thick, its prominent nodes are 3–5 lines apart; the pedicels 1 line long; the semiinferior ovary is obconical, 2 lines long, 3 lines broad; the sepals 2 lines long and broad; the flower expanded is 1 in. in diameter. From the resemblance of its habit to that of *Lecythis elliptica*, it might be placed alongside of it, were it not for its erect ovules; but it resembles greatly that of *Chytroma retusa*.

18. Chytroma rubriflora, nob.: ramulis striatis, rimosis, subferrugineo-ochraceis, pruinoso-opacis, lenticellis verruculosis; foliis ovato- vel oblongo-ellipticis, imo obtusis, et in petiolum breviter acutatis, apice in acumen breve latiusculum obtusum recurvatum constrictis, rigide chartaceis vel subcoriaceis, subintegris vel in marginibus cartilagineis subrevolutis crenulatis, supra fusco-viridibus, subopacis, nervis patentim divaricatis semiimmersis, reticulatis, costa tenui prominula, subtus subnitentibus, luride vel hepatice opacis, costa striata, pulverulenta, prominente, nervis venisque stramineis prominulis, undique minute granulatis; petiolo semitereti, canaliculato, marginato, subtus corruguloso, limbo 7–8plo breviore: panicula axillari et terminali e racemis 3–4 congestis; rachi striata, crebre nodosa;

floribus parvis, rubris, vel roseo-purpureis; pedicellis recurvis valde corrugulatis, calyci æquilongis; sepalis subimbricatis, ovatis, obtusis, fuscis, crassiusculis, rugulosis, marginibus submembranaceis rubris; petalis parvis, rubris; ovario infero, parvo, turbinato, corrugulato, 4-loculari, ovulis in quoque loculo 3–4, e basi erectis, vertice subconvexo, radiatim striato; stylo tereti, subincurvo; stigmate parvo, albo. In Guiana: *v. s. in herb. Mus. Brit.*, Cayenne (*Van Rohr*), Karaouary (*Sagot*, 1032, *bis*).

This plant was confounded by Sagot with another of his collection under the same number, described by me under *Eschweilera corrugata*: from this it differs in its shorter, broader, more obtuse leaves, of a rufescent hue, with a different nervation, in its inflorescence, and in its 4-celled ovary. It is not unlike *Lecythis rubicunda* in its general appearance, but differs in its broader more obtuse leaves, in its inflorescence, in its rugulose pedicel and ovary, and in the vertex of the latter; it has also fewer ovules, erect (not suspended).

It is said to be a lofty tree, with red flowers: the axils of its branchlets are $\frac{3}{4}$–1 in. apart; the leaves are extremely dark when dried, 3–5 in. long, $1\frac{1}{2}$–$2\frac{1}{4}$ in. broad, on a petiole 5–6 lines long, and with about 10 pairs of nerves, with several others shorter and intermediate, all anastomosing in a transverse reticulation. The very branching panicle is 3 in. long, its slender branches about 2 in. long, with nodes 1 line apart; the pedicels 2 lines long; the sepals $1\frac{1}{2}$ line long.

19. Chytroma rosea, nob.: *Lecythis rosea*, Spruce; Berg in Mart. Fl. Br. *l. c.* p. 488: ramulis subteretibus, subflexuosis, fusco-brunneis, lenticellis flavidis verruculosis; foliis subapproximatis, ovatis, vel ovali-oblongis, aut sublanceolatis, imo obtusis, vel in petiolum sensim acutioribus, apice obtusis, vel brevissime et acute acuminatis, subintegris, vel in margine revoluto obsoletissime serrulatis, sæpe complicatis, rigide chartaceis, supra profunde viridibus, nitidiusculis, et ad venas reticulatas subfoveolatis, nervis subpatentibus et marginem versus arcuatim nexis omnino immersis, subtus opacis, ferrugineo-hepaticis, glauco-pruinosis, nervis tenuibus venisque reticulatis prominulis, costa valida, striolata, valde prominente; petiolo pruinoso, profunde sulcato, marginibus tenuibus introflexis, subtus ruguloso, limbo 11–14plo breviore: racemis axillaribus, vel pluribus terminalibus, paniculam simulantibus, folio brevioribus; rachi fusca, glauco-pruinosa, striata, subapproximatim longe nodosa; bracteis infra nodos caducis; pedicellis ad nodos articulatis, corrugatis, refractis, quam sepala longioribus; floribus mediocribus; sepalis oblongo-ovatis, subobtusis, subinæqualibus, crassis, fuscis, pruinosis, rugoso-carinatis, imo gibbosis, marginibus membranaceis et ciliolato-denticulatis; petalis obovato-oblongis, 3plo longioribus, crassiusculis, marginibus membranaceis et denticulatis; ovario semiinfero, parvo, corrugato, 4-loculari, ovulis in quoque loculo 4, e basi erectis, vertice intra discum elevato, conico, radiatim striato; stylo subulato subincurvo; stigmate minimo, squamuloso. In Brasilia, prov. Amazonas: *v. s. in herb. variis*, Rio Negro, inter Barra et Barcellos (*Spruce*, 1920).

The axils of its branchlets are $\frac{3}{8}$ in. apart; the leaves are $3\frac{1}{2}$–8 in. long, $1\frac{1}{4}$–$2\frac{1}{4}$ in.

broad, on a petiole 3–6 lines long: the terminal raceme is $2\frac{1}{2}$–3 in. long, with nodose axils about $\frac{1}{4}$ in. apart; the refracted pedicels are 3 lines long; the sepals 3 lines long, 2 lines broad; the petals 4–6 lines long, 2–3 lines broad; the androphorum 4 lines in diam.; the style 2 lines long: the flower expanded is $1\frac{1}{2}$ in. in diameter.

20. Chytroma rorida, nob.: *Lecythis rorida*, Spruce, Berg in Mart. Fl. Bras. *l. c.* 488: ramulis crassiusculis, fuscis, flexuosis, angulato-striatis, corrugulosis, verruculosis, roride pruinosis, junioribus tenuioribus et lævioribus; foliis subapproximatis, obovatis, imo obtusis et subito cuneatim acutatis, apice rotundatis, et in acumen subbreve acutum recurvulum repente constrictis, sæpe complicatis, subintegris, vel ad marginem subrevolutum punctis fuscis obsolete serratis, rigide chartaceis, supra profunde viridibus, valde opacis, ad nervos subsulcatis, nervis tenuissimis subpatenti-divaricatis semiimmersis et flavide pruinosis, valde reticulatis, costa pruinosa, prominula, subtus pallidioribus, brunnescentibus, pruinoso-opacis, costa striolata nervisque costatis prominentibus, venis prominulis; petiolo supra plano, marginibus late introflexis, subtus corrugato, limbo 9plo breviore: panicula terminali pluriramosa, ramis folio subæquilongis aut brevioribus, ramulis paucis brevibus, curvatim adscendentibus; rachi recta, fusca, angulosa, transversim corrugulosa, albido-pruinosa, verruculosa, approximatim valde nodosa; floribus 30–50, mediocribus; pedicellis imo articulatis, anguloso-corrugulosis; sepalis istis æquilongis, subæqualibus, rotundato-obovatis, extus convexis, granulato-rugulosis, ad marginem membranaceum subciliatis; petalis subinæqualibus, ovatis, imo sensim unguiculatis, marginibus late membranaceis; ovario semiinfero, 4-loculari, ovulis 2 in quoque loculo, placenta basali erectis, vertice intra discum valde elevato conico radiatim striato; stylo tenui incurvulo, brevi, apice cavo, albidulo. In Brasilia, prov. Amazonas; *v. s. in herb. variis*, ad Rio Negro prope Barra (*Spruce*, 1797).

I have referred this species to *Chytroma* on account of its few erect ovules in each of the 4 cells of the ovary. The axils of its branchlets are $\frac{1}{2}$ in. apart; the leaves are 4–5 in. long, $1\frac{1}{2}$–$2\frac{1}{2}$ in broad, on a petiole 4–6 lines long; and they have about 14 pairs of nerves, with others shorter, intermediate, all anastomosing; the panicle is 7 in. long, its branches 4 in. long, its branchlets 1–3 in. long, all floriferous, with nodose axils 1–2 lines apart; the pedicels 1–2 lines long; the sepals 2 lines long, 1 line broad; the petals 6 lines long, 4 lines broad; androphorum 4 lines in diam.; style 2 lines long.

21. Chytroma retusa, nob.: *Lecythis retusa*, Spruce, Berg in Mart. Fl. Bras. *l. c.* p. 487: ramulis validis subangulatis, fuscis, vel cinereo-fuscis, rugosis, verruculosis, subpruinosis; foliis late ovatis, vel late oblongis, imo obtusis et in petiolum latiuscule ac subito acutatis, apice truncatis, profunde retusis, interdum cum acumine brevissimo acutiore curvato in sinu subito constrictis, subintegris, vel marginibus undulatis subrevolutis punctis fuscis obsolete serrulatis, coriaceis, supra subnitentibus, profunde viridibus, reticulatione impresso-rugulosis, minutissime granulosis, ad nervos sulcatis, nervis tenuibus, recte divaricatis, parallelim subapproximatis, pruinosis, immersis, creberrime reticulatis, costa plana, imo latiore, pruinosa, subtus canescenti-

pallidis, vel luride et fulvide pruinosis, nervis costatis, venisque reticulatis prominulis, costa valida fusca striata prominente; petiolo valido, fusco, pruinoso, supra sulcato, submarginato, subtus corrugulato-striato, limbo 10plo breviore: panicula axillari, sæpius terminali, multiramosa, folio longiore; ramorum rachi valida, adscendente, angulato-rugosa, opaca, crebre longe nodosa; floribus majusculis, approximatis; pedicellis ad nodos articulatis, fuscis, rugosis, angulato-sulcatis; sepalis rotundatis, fuscis, crassiusculis, granulato-verruculosis, gibbosis, marginibus membranaceis ciliato-denticulatis; petalis subinæqualibus, oblongis, unguiculatis, crassiusculis, extus granulato-maculatis, marginibus membranaceis, ciliatis; ovario infero, breviter turbinato, vel semigloboso, ruguloso, 4–5-loculari, aut interdum 3-loculari, ovulis in quoque loculo 2–4, e basi erectis, vertice intra discum latum subconcavo, radiatim striato; stylo tereti, striato, sepalis paullo breviore; stigmate albo, 4-lobulato. In Brasilia prov. Amazonas, *v. s. in herb. variis*, Rio Negro prope Barra (*Spruce*, 1166).

From its general resemblance, especially in the venation of its leaves and the peculiar character of the inflorescence, this species bears more the appearance of a *Couroupita*; but the section of the ovary shows that it belongs to *Chytroma*; it closely resembles *Chytroma valida*. The axils of its rather stout branches are about $\frac{3}{4}$ in. apart; the leaves are $3\frac{3}{4}$–$6\frac{3}{4}$ in. long, $2\frac{1}{2}$–$4\frac{1}{8}$ in. broad, on a petiole 6–12 lines long,; they have about 18 pairs of parallel nerves, with others shorter intervening, all anastomosing. The panicle is about 8 in. long, its branches 2–$2\frac{1}{2}$ in. long, their prominent nodes 2–3 lines apart; the pedicels 1 line long; the sepals $1\frac{1}{2}$ line long; the petals 11 lines long, 7 lines broad; androphorum 9 lines in diameter.

22. Chytroma ovalifolia, nob.: *Lecythis ovalifolia*, DC. Prodr. iii. 292; Berg in Mart. Fl. Br. *l. c.* p. 486; in Linn. xxvii. 453: ramulis teretibus, striatis, ochraceo-opacis; foliis majusculis, oblongis, vel lanceolato-oblongis, imo rotundatis, vel obtusis, apicem versus sensim angustioribus et in acumen breve obtusatum attenuatis, subintegris, vel punctis fuscis obsoletissime serrulatis, supra viridibus, lævibus, nervis numerosis divergenti-adscendentibus paullo prominulis, reticulatis, costa tenui, imo crassiore, subtus concoloribus, valde opacis, nervis tenuibus stramineis prominulis, costa striolata prominente; petiolo semitereti, supra plano, marginato, corrugulosa, limbo 15–20plo breviore: racemis binis, terminalibus, folio multo brevioribus; rachi subvalida, nodoso-flexuosa, pallide ochracea, pruinosa, crebre verruculosa; pedicellis validis, patentibus, verruculosis, sepalis æquilongis, imo 3-bracteolatis; sepalis subæqualibus, subrotundis, ochraceo-pruinosis, gibbosis, margine ciliatis; petalis ovatis, convexis, velutino-pruinosis; ovario semisupero, 4-loculari, ovulis in loculis paucis, uniserialiter radiantibus, vertice altiuscule annulari, subconcavo, striatim radiato; stylo obtuse conico, umbonato. In Brasilia, prov. Amazonas, *v. s. in herb. Hook.*, Rio Negro (*Martius*).

This typical plant of a species referred by DeCandolle and Berg to *Lecythis*, appears to me to belong to *Chytroma*, because of its eaves, its inflorescence, with three bracts at

the base of the thick pedicels, and a half-superior 4-celled ovary obtusely umbonated at the summit. The axils of its branchlets are $\frac{3}{4}$–$1\frac{1}{4}$ in. apart; the leaves are 5–10 in. long, $1\frac{3}{4}$–4 in. broad, on a petiole 4–6 lines long; the rachis of the raceme is 3–4 in. long, its nodes 2–$2\frac{1}{2}$ lines apart; the bracts, 2 lateral, 1 exterior, are $1\frac{1}{4}$ line long; the pedicels 2 lines long; the sepals 1 line long, $1\frac{3}{4}$ line broad; the petals 10 lines long.

It has quite the habit of the other species of *Chytroma* before enumerated.

23. Chytroma apiculata, nob.:—ramulis brunneis, opacis, lenticellis verruculosis; foliis ovato-ellipticis, imo obtusis (in junioribus ad petiolum breviter acutatis), apice in acumen breve vel longius, acutum, sæpe recurvulum subito apiculatis, subintegris, vel in margine cartilagineo revoluto punctis obsolete serrulatis, rigide chartaceis, supra pallide viridibus, subnitentibus, minutissime granulatis, nervis paullo prominulis, reticulatis, costa striata, subtus brunnescentibus, opacis, costa validiore prominente, nervis venisque prominulis; petiolo fusco, canaliculato, corruguloso, limbo 15–20plo breviore: racemo axillari, simplici, folio multo breviore, vel 2–3 terminalibus congestis; rachi nodosa, fusca; pedicellis tenuibus; calyce duplo longioribus, angulatis, rugulosis; floribus majusculis; sepalis ovalibus, carnosulis, imo gibbosis et rugulosis; petalis ovatis, majusculis, concavis; ovario semisupero, tuberculatim rugoso, 4-loculari, ovulis paucis e basi erectis, vertice depresse pulvinato, elevato, radiatim striato, stylo brevi, obtuse conico umbonato. In Brasilia: *v. s. in herb. Hook.*, sine loco (*Burchell*, 9618).

A species probably from the Amazonas region, judging by Burchell's number: it is placed in this genus on account of its nearly superior ovary umbonated by a short conical style, and approaches the preceding in several characters. The axils of its branches are 1 in. apart; the leaves are $3\frac{1}{4}$–$5\frac{1}{4}$ in. long, $1\frac{3}{4}$–$2\frac{1}{2}$ in. broad, on a petiole 3–4 lines long, and have about 10 pairs of nerves, with others shorter and intermediate, all anastomosing; the terminal raceme is 2–3 in. long; nodes of rachis 1-2 lines apart; the flower in bud is $\frac{3}{4}$ in. in diam.; sepals $1\frac{1}{2}$ line long, petals 7 in. long, 6 in. broad.

24. Chytroma Marawynensis, nob.; *Lecythis Marawynensis*, Berg in Mart. Fl. Br. *l. c.* 489, tab. 69: ramulis subrugosis cinereis; foliis ovato-oblongis, vel oblongis, imo obtusis et in petiolum longiuscule acutis, apice in acumen breve obtusulum sæpe recurvatum subito constrictis, chartaceis, subundulatis, integris vel obsoletissime serrulatis, nervis tenuibus subpatulis arcuatim nexis venisque reticulatis parum prominulis; petiolo limbo 8–9plo breviore: paniculis vel racemis axillaribus et terminalibus, amplis, pruinosis; rachi gracili; pedicellis cernuis; bracteis ovatis, membranaceis, caducis; sepalis pedicello æquilongis, inæqualibus, oblongis, obtusis, margine membranaceis et crenato-denticulatis; petalis obovatis, albis, in siccitate flavis; ovario semiinfero 4–5-loculari, ovulis in quoque loculo 4, biseriatis, e basi erectis, vertice convexo, radiatim striolato; stylo longiusculo. In Guiana Batava, Surinam (*Wullschlægel*, 1473): (*non vidi*).

A species apparently near *C. chartacea*, differing in its leaves somewhat cuneate at

the base, but agreeing in its semiinferior ovary, with erect ovules, on which account it is referred to this genus; the leaves are 2–3 in. long; 9–17 lines broad, on a petiole 3–4 lines long; racemes 3 in. long; pedicels $1\frac{1}{2}$–2 lines long; sepals 1–2 lines long; petals 5 lines long; androphorum 5 lines in diam.; style 1 line long.

25. Chytroma perspicua, nob.: ramulis fuscis, subcinereis, lenticellis flavidis verrucosis; foliis oblongis, imo subacute obtusis, apice acutis, vix acuminatis, tenuiter chartaceis, subintegris, vel in marginem tenuiter cartilagineum subrevolutum punctis nigris obsoletissime serratis, supra viridibus, subnitidis, minutissime granulatis, nervis tenuibus prominulis, subtus paullo pallidioribus, valde opacis, sub lente lentiginose pruinosis, nervis venisque reticulatis flavidis prominentibus; petiolo canaliculato, fusco, limbo 12plo breviore: racemis axillaribus, fere terminalibus, folio multo brevioribus, plurifloris; floribus mediocribus; pedicellis subreflexis; sepalis 8, subæqualibus, oblongis, obtusis, crassis, fuscis, valde convexis, rugulosis, imo gibbosis, imbricatis; petalis 8, istis 5plo longioribus, obovatis, concavis, submembranaceis, imbricatis, androphori carnosi galea selliformi, appendicibus creberrimis, subbrevibus, plerumque antheriferis, seriebus 2 exterioribus latis acutis sterilibus; ovario infero, 4-loculari, ovulis in quoque loculo plurimis radiantibus, vertice intra discum valde convexo, radiatim striato; stylo brevi, crasso, umboniformi. In Guiana: *v. s. in herb. Hook.*, Guiana (*Poiteau*, sub *Lecythis platycarpa*).

A species differing from *Lecythis platycarpa*, Poit., in its less-pointed leaves, its shorter, straight, and slender raceme (not long, stout, and geniculated), its much smaller flowers, its 8 sepals, 8 petals, and a 4-celled ovary. It approaches much nearer to *Chytroma amara* in its habit and inflorescence; but its leaves are less pointed, have shorter petioles, flowers with 8 sepals, 8 petals, and an ovary whose vertex is less elevated, and a more umboniform style. Its leaves are $6\frac{1}{4}$–$7\frac{1}{4}$ in. long, $2\frac{1}{2}$–$2\frac{3}{4}$ in. broad, on petioles 6–7 lines long; the raceme is 1–$1\frac{1}{2}$ in. long; pedicels 4 lines long, striated; sepals 3 lines long, 2 lines broad; petals 12 lines long, 6 lines broad.

6. Eschweilera. (Plate XXXIV. c.)

The previous remarks upon the structure of this genus (antè, p. 165), showing how it diverges from *Lecythis*, with which it has been generally confounded, are sufficiently ample, requiring no further elucidation here. It differs from *Chytroma* in its ovary being always 2-locular, and its pyxidium constantly 2-celled; its seeds are more rugose, with an imbedded raphe. Its generic characters may be summarized in the following manner:—

Eschweilera, Mart.; DC. Prod. iii. 293: *Lecythis* (in parte) Berg, Camb.: calycis adnati *sepala* et *petala* ut in *Lecythide*: *androphorum* ei ejusdem simile, sed cum galeæ appendiculis sæpius anantheris: *ovarium* semiinferum, turbinatum, vertice intra discum planum elevato, semper 2-loculari; *ovula* in quoque loculo pauca, sessilia e basi erecta, anatropa: *stylus* brevissimus, obtusus; *stigma* minimum, subglobosum, papillosum. *Pyxidium* mediocre vel subparvum, turbinatum, supra, vel infra, aut ad medium *zona calycari* e sepalis sæpe persistentibus linea nexis cinctum: *vitta interzonalis* altitudine varia: *zona superior* orbicularis: *operculum* isti conforme, mox solubile et deciduum, supra convexum

sæpius umbonatum, infra valde concavum, sine columella, dissepimenti mox evanidi vestigio signatum, cum *velario* intra marginem prope faucem descendente munitum: *pericarpium* (operculumque) paullo crassum, coriaceum, sine axi centrali, primum 2-loculare, dissepimento sæpius evanido. *Semina* in quoque loculo 1–3, sicca, ovata, interdum pressione subangulata, utrinque rotundata, erecta, hilo majusculo basali affixa: *testa* crasse crustacea, vel coriacea, scrobiculatim rugosa, cum *raphe* ab hilo ad apicem faciei ventralis adscendente omnino immersa, cujus ramis plurimis longitudinaliter descendentibus et furcatis ibi dispersis signata: *integumentum internum* firme membranaceum, sæpe laxum, et mucilagine fusca grumosa sæpe intus instructum: *embryo* exalbuminosus, ovatus, homogeneus, fuscus, cerco-carnosus, amarus, structura ei *Chytromæ* similis.

Arbores *frondosæ Americæ meridionalis, habitu* Lecythidis.

1. Eschweilera angustifolia, Mart. Fl. Ratisb. xx. (1837), Beib. ii. 89: *Lecythis angustifolia*, Berg (excl. syn.) in Mart. Fl. Bras. *l. c.* p. 489, tab. 7. fig. 162; tab. 70 et 71: ramulis tenuibus, teretibus, fusco-brunneis, corrugulato-striatis, obsolete verruculosis; foliis oblongo-lanceolatis, imo subacutis, apice in acumen angustum calloso-mucronatum sensim acuminatis, margine cartilagineo subrevoluto leviter crenato-serrulatis, chartaceis, supra viridibus, opacis, ad nervos subremotos sulcatis, venis reticulatis prominulis, subtus brunnescentibus, opacis, costa nervisque prominentibus; petiolo fusco, tenuissimo, submarginato, ruguloso, limbo 10–12plo breviore: racemis terminalibus, folio brevioribus, rachi tenui, lenticellata, 5–8-flora; pedicellis calyce longioribus minute granulosis; calyce brevi, rotato-cupuliformi, margine crenato-lobato, lobis 6 obsolete rotundatis extus minute verruculosis; petalis distincte 4, ovato-rotundatis, concavis, subæqualibus, albis, flavide punctatis; ovario subinfero, hemisphærice turbinato, flavide verruculoso, 2-loculari, ovulis plurimis, e basi radiatim erectis, vertice depresse pulvinato radiatim striato, stylo brevi, obtuse umbonato: pyxidio subgloboso, imo hemisphærico et stipitato, infra medium zona calycari lineari-circulari cincto; vitta interzonali acclive convexa, diametri 7am partem alta; zona superiore quam altera minore, integra, circulari; operculo vitta duplo altiore, sensim convexo, apice umbonato, intus concavo, septi vestigio notato, intra marginem velario descendente aucto; pericarpio subcrassulo, coriaceo, striato-ruguloso, septo evanescente demum 1-loculari, 10-spermo; seminibus angulato-ovatis, erectis, 2-seriatis. In Brasilia, prov. Rio de Janeiro: *v. s. in hb. Hook.*, Monte Corcovado in sylvis (*Martius*, 61); Corcovado (*Graham*); Serra d'Estrella (*Langsdorf*): *fructus* mihi *non visus*.

This species, originally described in the Ratisbon Flora, is distinguished from all others of the genus by its 4-petalous flowers. It is a tree 30–40 feet high, bearing the vernacular name of *Ibiribá-rána*. Its trunk is bare to the height of 20 feet, with a wide spreading head: the axils of its slender branchlets are $\frac{1}{2}$–$\frac{3}{4}$ in. apart; the leaves are $2\frac{1}{4}$–$3\frac{1}{4}$ in. long, 9–14 lines broad, on a petiole 2–3 lines long, with about 8 pairs of subpatent nerves; the raceme is 1–$1\frac{1}{4}$ in. long, the pedicels $1\frac{1}{2}$–2 lines long, the expanded margin of the calyx 4 lines in diam., less than $\frac{1}{2}$ line broad, obsoletely lobed; the flower expanded 2 in. across; the 4 petals 10 lines long, 8 lines broad: and this number is constant according to Martius, as shown in the plates quoted; but Berg states that he found always 6 petals, probably in those of the following species, which he confounded with

this. The pyxidium (Plate LIX. fig. 20) is $2\frac{1}{4}$–3 in. long, $2\frac{1}{4}$–$3\frac{1}{2}$ in. broad in the middle, the portion below the calycary zone 1 in. high, upon a stipitate prolongation $\frac{3}{8}$ in. long; the interzonary band is 5–6 lines high; the operculum 2–3 in. in diam., 1–$1\frac{1}{2}$ in. high, hollow within, provided within the margin with a descending velarium 4–5 lines deep; the pericarp, obsoletely 2-locular, is 3–4 lines thick on the sides, nearly $\frac{1}{2}$ in. at the base, where it is marked by the hilar cicatrices of 10 erect seeds, which are 1 in. long, $\frac{3}{4}$ in. broad. Martius says that the seeds are imbedded in pulp, "carne parca e septo propullante," an improbable circumstance when the seeds, in 2 series, are sessile upon the bottom of the pericarp, and contrary to what occurs in every other species.

2. Eschweilera compressa, nob.: *Lecythis compressa*, Vell. Fl. Flum. p. 222, Icon. v. tab. 87: ramulis brunneis, teretibus, rugose striolatis; foliis ellipticis vel elliptico-oblongis, imo obtusis, sæpe subito acutatis, apice longiuscule attenuatis et recurvule acuminatis, grossiuscule sinuato-dentatis, dentibus obtusis, marginibus paullo reflexis, chartaceis, supra pallide viridibus, planis, opacis, nervis pluribus, tenuibus, semiimmersis, valde reticulatis, costa tenui, subtus opacis, brunnescentibus, costa nervis venisque prominentibus; petiolo subtenui, supra plano, subtus leviter striolato, limbo 15–20plo breviore: racemo terminali, subbrevi; rachi subtenui, striata, minute granulata, 5–6-flora; floribus mediocribus; pedicellis brevissimis; calyce subcupulari, usque ad medium in lobos 6 diviso, lobis obtusis, marginibus membranaceis; petalis 6, rotundatis, concavis, extus flavide maculatis, exteriore majusculo et latissimo; ovario subinfero, corrugulato, 2-loculari, ovulis paucis, in unica serie erectis, vertice depresse conico, striato, stylo brevi obtuso apiculato: pyxidio depresse globoso, imo hemisphærico, non stipitato, paullo supra medium zona calycari linea irregulari vix prominente cincto; vitta interzonali acclive convexa, diametri $\frac{1}{4}$ partem alta; zona superiore quam altera paullo minore, irregulariter circulari; operculo subconice convexo, umbone crasso obtuso apiculato, intus concavo, septi vestigio signato, intra marginem velario crasso faucem descendente aucto; pericarpio crassiusculo, pallide brunneo, subscrobiculatim ruguloso, intus lævi, dissepimento omnino evanido, imo seminum cicatricibus notato; seminibus sæpius 6, vel paucioribus, 1-seriatis, compresse ovatis, dorso convexis, hilo lato basali affixis, fusco-brunneis, undique scrobiculatim rugulosis, lineis nigris circiter 6 sulcatim immersis ab hilo curvatim adscendentibus signatis. In Brasilia, prov. Rio de Janeiro: *v. v. in flore et fructu* ad Botofago, in sylvis non longe a mari.

This species, though closely allied, is manifestly different from the preceding, being of smaller stature, with larger, thicker, paler leaves coarsely serrated, a raceme with fewer flowers half their size, a more distinctly lobed calyx, and 6 oval petals. It is a tree about 12 feet high, growing near the sea, the species being well represented in the drawing of Velloz: the axils of the branchlets are $\frac{3}{4}$ in. apart; the leaves are 3–5 in. long, 1-$1\frac{3}{4}$ in. broad, on a petiole $2\frac{1}{2}$–3 lines long, and with about 11 pairs of nerves; the raceme is $\frac{3}{4}$–1 in. long, with axils about 4 lines apart; pedicels 3 lines long; the calyx expanded is $4\frac{1}{2}$ lines across (the disk being 2 lines in diam.), the smaller petals suborbicular, 5 lines long and broad, the outer petals 7 lines long, 6 lines broad, extremely

convex, pale yellow; androphorum 5 lines in diam.; the pyxidium (Plate LIX. fig. 21) is 2 in. long, $2\frac{1}{2}$ in. broad, the calycary zone 9 lines above the base, the interzonal band is $4\frac{1}{2}$ lines high, the upper zone and operculum $2\frac{1}{8}$ in. in diam., the latter 1 in. high, hollow, sub-2-celled within, with a velarium descending 3–4 lines within the mouth; the pericarp, 2 lines thick, shows upon the inner surface the line of the evanescent dissepiment; the seeds are 1 in. long, $\frac{3}{4}$ in. broad; the coriaceous testa is 1 line thick on the dorsal face, slightly thinner on the opposite face.

3. Eschweilera rigida, nob.: ramulis fulvo- vel fusco-brunneis, pruinoso-opacis, subangulatis, interrupte sulcatis, cortice rimoso subverruculosis; foliis elliptico-ovatis, imo in petiolum breviter et subito acutatis, apice in acumen recurvatum acutissimum repente attenuatis, subintegris, vel marginibus cartilagineis vix revolutis punctis nigris obsolete serrulatis, rigide chartaceis, supra viridibus, subopacis, minutissime granulatis, nervis parallele divergentibus, prominulis, costa carinata, subtus pallidis, opacis, valde ochraceo-pruinosis, nervis venisque grosse et crebre reticulatis prominulis, costa striata, prominente; petiolo canaliculato, marginato, subtus corrugulato, limbo 10–12plo breviore: panicula terminali, 3-ramosa, ramis simplicibus, alternatim 16–20-floris; pedicellis sulcato-corrugulosis; sepalis obovatis, rotundatis, margine denticulatis, extus carinatis, ovarioque granulatim rugosis, pruinosis; petalis ovatis, crassiusculis; ovario infero, turbinato, 2-loculari, ovulis 2–3 in quoque loculo, e basi erectis, vertice plano, paullo elevato, radiatim sulcato; stylo tereti sepalis dimidio breviore: pyxidio oblongo-ovato, utrinque obtuso, imo pyriformi, circa medium zona calycari e vestigiis sepalorum obsolete 6-lobata cincto; vitta interzonali verticali, diametri 4tam partem alta; zona superiore integra circulari; operculo vitta multo altiore, pulvinato et alte obtuso-umbonato, subtus concavo, linea dissepimenti signato, cum velario crasso intra faucem descendente; pericarpio coriaceo, crasso, granulatim scrobiculato, pallide brunneo, 2-loculari. In Venezuela, versus Brasiliæ confinia: *v. pl. s. in flore et in fructu immaturo in hb. Hook.*, Rio Guainia (*Spruce*, 3505); *v. fr. s. in Mus. Kew.*, Rio Guainia (*Spruce*).

A comparatively small tree, 20 feet high, from the banks of the river Guainia, or principal source of the Rio Negro, flowing from the mountains of New Granada.

The axils of the racemes are 1–$1\frac{1}{2}$ in. apart; the leaves are $3\frac{1}{2}$–$6\frac{1}{2}$ in. long (including the narrow cuspidate apex $\frac{1}{2}$ in. long), 2–$2\frac{1}{2}$ in. broad, on a petiole 4–6 lin. long, with about 14 pairs of parallel immersed scarcely visible nerves; the raceme-like branches of the panicle are 3–4 in. long, with prominent nodes about 3 lines apart; the pedicels 2 lin. long; the sepals $1\frac{1}{2}$ line long, 1 line broad. The unripe fruits upon the flowering specimens are more depressedly turbinate, $\frac{3}{4}$ in. long, 1 in. broad: but the ripe fruit in the Kew Museum (Plate LX. fig. 1), from the same locality, is extremely different in form, leading to the supposition that it might belong to another species not seen by Spruce; it is unusually elongated in form, $3\frac{1}{2}$ in. long, with a calycary zone $1\frac{1}{2}$ in. above the base, and $2\frac{3}{8}$ in. in diam.; the interzonary band is $2\frac{1}{4}$ in. in diam., and $\frac{1}{2}$ in. high; the upper zone and operculum are $2\frac{1}{4}$ in. in diam., the latter $1\frac{3}{8}$ in. high, quite hollow within, with a trace of a single dissepiment, and a thick velarium descending into the

cell for a depth of 5 lines; the operculum is $\frac{3}{4}$ in. thick at the umbonate summit, 3 lines thick at the sides; the body of the pericarp is $\frac{3}{4}$ in. thick at the bottom, 4 lines thick at the sides; within are 4 cicatrices, where the seeds were attached.

4. Eschweilera serrulata, nob.: ramulis teretibus, fuscis, substriatis, lenticellatis; foliis ovatis, imo rotundatis, et in petiolum breviter acutatis, sursum sensim paullo angustioribus, et in acumen subbreve obtusulum subito constrictis, in margine cartilagineo subrevoluto crenato-serrulatis, dentibus fusco-glandulosis, chartaceis, supra profunde viridibus, valde opacis, subplanis, nervis tenuibus divaricatis vix prominulis, reticulatis, costa tenui, carinata, flavida, prominula, subtus luride brunnescentibus, pruinoso-opacis, nervis venisque flavidis prominentibus, costa striolata, flavida, prominente; petiolo marginato, corruguloso, limbo 15plo breviore: racemis terminalibus, folio multo brevioribus; rachi subflexuosa, subnodosa: pyxidio subgloboso, imo hemisphærico; ad medium zona calycari indistincta cincto; vitta interzonali acclive convexa, diametri 5tam partem alta; zona superiore integra, quam calycaris paullo minore; operculo convexo, apice umbone majusculo obtuso apiculato, intus concavo, dissepimenti vestigio signato, cum velario intra faucem descendente; pericarpio crassiuscule coriaceo, fusco-brunneo, opaco, sublævi, lenticellis flavidis sparsis maculato, intus obsolete 2-loculari, imo cicatricibus seminum signato. In Brasilia septent.: *v. pl. s. in Mus. Brit.*, Maranhaõ (*Gardner*, 6028); *v. fr. s. in Mus. Kew.* (*Gardner*).

A low tree or shrub, 8–12 feet high, in dry woods near Maranhaõ: it is a species near *E. compressa*, differing in its larger and more ovate leaves and somewhat larger fruit; the axils of its branchlets are $\frac{3}{4}$–1 in. apart; the leaves are 3–$5\frac{1}{2}$ in. long, $1\frac{5}{8}$–$2\frac{3}{4}$ in. broad, on a petiole $2\frac{1}{2}$–4 lines long, with about 13 pairs of yellow nerves.

Gardner says (Trav. p. 107) that its fruit is different from that of another species he saw at Pernambuco (*Chytroma Ibiriba*). The pyxidium (Plate LX. fig. 4) is $2\frac{1}{4}$ in. long, $2\frac{3}{4}$ in. broad at the calycary zone, which is 1 in. above the base; the interzonal band is $\frac{1}{2}$ in. high; the upper zone and operculum $2\frac{1}{4}$ in. in diam., the latter 9 lines high, with the velarium descending 3 lines within the mouth; the pericarp is about 2 lines thick; the seeds are about 1 in. long, 6–8 lines broad, dorsally rounded, angular on the faces, not granosely rugose (as in *P. compressa*), but smoother, subrugose, minutely granular, with the branches of the raphe semiimmersed.

5. Eschweilera Fendleriana, nob.: ramis crassis, rugosis: ramulis fuscis, opacis, subbreviter flexuosis, angulato-striatis; foliis ovalibus, imo rotundatis, vel obtusis, apice rotundiusculis, et in acumen brevissimum obtusulum recurvum abrupte constrictis, subintegris, vel ad marginem cartilagineum revolutum punctis obsolete serrulatis, rigide coriaceis, supra pallide viridibus, crebre punctato-granulosis, nervis tenuissimis omnino immersis, eveniis, opacis, circa costam prominulam sulcatis, subtus pallidissimis, opacis, nervis prominulis, venis crassis creberrime favoso-reticulatis, costa prominente, imo crassiore et fuscata; petiolo profunde canaliculato, fusco, corrugulato, limbo 12plo breviore: racemis in ramulis novellis terminalibus, hinc paniculam pauci-

floram simulantibus; floribus majusculis, pedicellis longiusculis, sulcatis, rugulosis; sepalis ovatis, subinæqualibus, subgranulosis, rubentibus, pulverulento-opacis, margine membranaceo subdenticulatis; petalis ovatis, submembranaceis, luteis; ovario fere supero, 2-loculari, ovulis paucis erectis, vertice alte conico; stylo subbrevi conico umbonato cum stigmate minimo subobsolete ciliato: pyxidio depresse globoso, imo turbinato et obtuse sulcato, infra medium zona calycari e vestigiis sepalorum cincto; vitta interzonali fere erecta, summo subconvexa, diametri quartam partem alta; zona superiore orbiculari; operculo valde depresso-pulvinato, subplanato, medio obtuse umbonato, subtus concavo, dissepimenti vestigio signato; pericarpio coriaceo, subtenui, 2-loculari; seminibus in quoque loculo 2, majusculis, oblongis, lateribus planioribus, imo affixis; testa rufula, granoso-scrobiculata. In Venezuela: *l. c. v. s. in herb. Hook.*, Tovar (*Fendler*); *v. fr. s. in Mus. Kew.* (*Fendler*).

This species comes near *E. ovata* in appearance: the axils of its flexuous branchlets are about $\frac{1}{2}$ in. apart; the leaves are 2–$2\frac{3}{4}$ in. long, $1\frac{1}{4}$–$1\frac{3}{8}$ in. broad, on a petiole 3 lines long, and have about 8 pairs of divaricated nerves curving near the margin, the reticulation of the veins being notably areolated; the panicle is 3 in. long, its branchlets 1–$1\frac{1}{2}$ in. long, bearing few flowers; the smooth slender pedicels are 7 lines long; the flower expanded is 2 in. across; the calyx expanded is 6 lines across; the sepals 2 lines long and broad; the petals 10 lines long, 5 lines broad; the ligula of the androphorum, including the basal ring, is 11 lines long; the semiglobular head, 10 lines in diam., is densely echinated with flattened linear acute appendages: the pyxidium (Plate LX. fig. 6) is $1\frac{1}{2}$ in. long, $2\frac{3}{8}$ in. broad, its turbinate base 9 lines below the calycary zone, which is $2\frac{1}{2}$ in. in diam.; the interzonal band, somewhat convex, is 8 lines high; the operculum is 2 in. in diam., nearly flat, and, including the umbonate tip, is 4 lines high; the pericarp is about $\frac{1}{8}$ in. thick; the seeds are 1 in. long, $\frac{3}{4}$ in. broad.

6. Eschweilera Guanabarica, nob.: ramulis teretibus, cinerascentibus, opacis, corrugato-striatis, lenticellis flavidis sparse verruculosis; foliis ovato-oblongis, imo obtusis, vel acutioribus, apice subito acute acuminatis, in marginibus revolutim crenatis punctis obsoletissime serrulatis, chartaceis, supra viridibus, in nervis semiimmersis sulcatulis, transversim reticulatis, costa tenui paullo prominula, subtus pallidioribus, costa nervisque prominentibus; petiolo tenui, fusco, supra sulcato, marginato, corruguloso, limbo 8plo breviore: racemis brevibus, axillaribus, pauciforis; pedicellis fructiferis brevibus, incrassatis: pyxidio mediocri, truncato-turbinato, vel subhemisphærico, medio zona calycari subevanida cincto; vitta interzonali suberecta, acclive convexa, diametri quintam partem alta; zona superiore quam calycaris vix angustiore, circulari; operculo depressissimo, minime convexo, centro sæpius fere raso, rarius breviter obtuse umbonato, intus concavo, septi vestigio signato, intra marginem velario ad faucem descendente aucto; pericarpio crasso, brunneo, opaco, ruguloso, punctis parvis flavidis verruculato, 2-loculari, dissepimento fere evanido, 4–6-spermo; seminibus ut in *E. compressa*. In Brasilia, prov. Rio de Janeiro: *v. pl. s. et fructum in herb. meo*, Maricá (*Mattos*).

This species, from the province of Rio de Janeiro, on the coast towards Cabo Frio, is

very distinct from the two first mentioned. The axils of its slender branchlets are $\frac{1}{2}$–$\frac{3}{4}$ in. apart; the leaves are 2–$2\frac{3}{4}$ in. long, 11–21 lines broad, on a petiole 3–$4\frac{1}{2}$ lines long, and with about 10 pairs of nerves. I have not seen the inflorescence; but the fructiferous raceme is 1 in. long: the pyxidium (Plate LX. fig. 7) is turbinate below the middle, is 2 in. long, $2\frac{1}{2}$ in. broad at the calycary zone, which is 13 lines above the base; the interzonary band is 5 lines high; the upper zone and operculum $2\frac{1}{8}$ in. in diam.; the latter is much flattened above, is only 3 lines high, obsoletely bossed in the centre, or with an obtuse umbonate point, 2 lines high; it is concave and subbilocular below, not very thick, and with a velarium descending 3 lines within the mouth.; the pericarp is stouter than in *E. compressa*, is 3 lines thick, white, opaque, and granulose in the mouth to a depth of 4 lines, where the velarium was attached, subpolished and brown below, where it is transversely ridged by the evanescent dissepiment. The seeds are ovate, subangularly rounded, scrobiculated and grooved along the furcated branches of the imbedded raphe, are 11–12 lines long, and 9 lines broad; in all the hollows of their surface we see a white efflorescence, noticed before in p. 166.

7. Eschweilera idatimonoides, nob.: *Lecythis idatimonoides*, Berg in Mart. Fl. Br. *l. c.* p. 496, tab. 73. fig. 3: arbuscula, ramulis pulverulentis, verruculosis; foliis sparsis ovali-oblongis, imo in petiolum attenuatis, apice acuminatis, subintegerrimis, vel in marginem revolutum punctis obsolete serrulatis, chartaceis, supra nervis tenuibus, patentim divaricatis, paullo prominulis, costa sulcata, subtus nervis venisque reticulatis prominulis, costa prominente; petiolo canaliculato, limbo 16plo breviore: racemis axillaribus, folio brevioribus; rachi valida, flexuosa, pauciflora; floribus majusculis; pedicellis validis, sulcatis, recurvis, calyce 2–4plo longioribus; sepalis ovatis, vel ovato-oblongis, obtusis, inæqualibus, crassis, convexis, carinatis; petalis obovatis, aureis; ovario semisupero, 2-loculari, vertice elevato, verruculoso, stylo brevi conico umbonato: pyxidio turbinato, imo rotundato, infra medium zona calycari e sepalis majusculis acutis inflexis linea nexis cincto; vitta interzonali subverticali, diametri 8vam partem alta; zona superiore integra; operculo circulari, quam vitta 3plo altiore, quam zona latiore, pulvinato, dein conice convexo, obtuse umbonato, irregulariter rugoso, subtus concavo, cum velario subangusto intra faucem descendente. In Guiana Batava (*Wullschlægel*, 203): *non vidi*.

The above acount is taken from Berg's description; it appears to differ from *L. Idatimon*, Aubl., in its arborescent habit, somewhat smaller leaves, longer pedicels, much larger flowers, longer and narrower sepals; from *L. Wullschlægelii* (*E. macrophylla*), in its much smaller leaves, more acute at base, with shorter petioles, and stouter racemes. It approaches *E. longipes*, and perhaps scarcely differs from it; it has the same-shaped leaves (though smaller and with shorter petioles); its inflorescence is remarkably like, a stout flexuous rachis of the same length, with few very large flowers upon very long pedicels, thickened at the apex, and its fruit of similar size and of the same proportions; it differs from *E. ovata* in its more oblong leaves, in its shorter raceme, with fewer flowers, on shorter and stouter pedicels. Its leaves, somewhat distant, are 4 in. long, $1\frac{1}{4}$ in. broad, on a petiole 2–3 lines long; the rachis of the raceme is $1\frac{1}{2}$–$2\frac{1}{4}$ in. long,

stout, flexuous, few-flowered; flowers very large; pedicels thickened above, 10 lines long; sepals 2–2½ lin. long, 1½–2 lin. broad; petals 14 lines long; androphorum 9 lines in diam.; style ¾ line long: pyxidium (Plate LX. fig. 9) 20 lines long; calycary zone 7 lines above the base, 2 in. in diam., with persistent sepals 6 lines long, and as broad at their base; interzonary band nearly 2 in. in diam., and 3 lines high; operculum 2 in. in diam., 11 lines high.

8. Eschweilera corrugata, nob.: *Lecythis corrugata*, Poit. Mém. Mus. xiii. 145, tab. 3; DC. Prodr. iii. 292; Miq. in Linn. xxii. 175; Berg in Linn. xxvii. 453: ramulis subvalidis, teretibus, obsolete rugoso-striatis, fuscis vel pallide brunneis, flavide lenticellatis; foliis elongato-oblongis, vel obovato-oblongis, imo obtusis, et in petiolum breviter aut sensim acutatis, apice in acumen acutum vel obtusulum sæpe canaliculatim recurvum sensim aut repente attenuatis, integris vel in marginibus cartilagineis subrevolutis punctis obsolete serrulatis, coriaceis, supra læviusculis, opacis, nervis tenuibus fere immersis, obscure reticulatis, costa paullo prominente, subtus pallidioribus, ferrrugineo-opacis, nervis venisque reticulatis prominulis, costa valida prominente; petiolo fusco, canaliculato, valde corrugulato, limbo 12plo breviore: racemis in axillis solitariis, vel 2–3 fasciculatis et terminalibus, folio brevioribus; rachi flexuosa, longe nodosa, angulato-striata, nodis approximatis cum pedicellis articulatis; pedicellis recurvulis rugosis, ovarioque transversim valde corrugulatis; sepalis oblongis, crassiusculis, granulatim rugulosis, carinatis, marginibus membranaceis obsolete denticulatis; ovario semisupero, 2-loculari, ovulis pluribus erectis, vertice alte conico, lævi, stylo brevissimo tereti apiculato: pyxidio turbinato, imo obconico, creberrime et grosse corrugato-rugoso, supra medium zona calycari e sepalorum vestigiis linea nexis cincto; vitta interzonali diametri tertiam partem breviore, erecta; zona superiore orbiculari; operculo pulvinato, convexo, sensim obtuse umbonato, intus concavo, vestigio dissepimenti signato, cum velario intra faucem late dependente; pericarpio coriaceo, crebre transversim corrugulato, dissepimento fere evanido obsolete 2-loculari; seminibus in quoque loculo binis, ovatis, basi affixis. In Guiana: *v. s. in herb. Mus. Brit. et Hook.*, Cayenne (*Martin*); Karaouary (*Sagot*, 1032); Demerara (*Parker*); *v. fr. s.* in *Mus. Kew.* (*Parker*).

A lofty forest tree, the trunk covered by a thick bark composed of more than 100 layers; its leaves are 4½–10 in. long, 1¾–3 in. broad, on a petiole 3–6 lin. long; the rachis of the raceme is 3–4 in. long; flowers pink; pedicels 4–5 lin. long; sepals 2 lin. long; petals 8 lin. long, 5 lin. broad; androphorum 5 lin. diam.; pyxidium (Plate LX. figs. 10, 11) is 1¼ in. long, 1⅛–1⅜ in. broad; calycary zone 6–7 lines above the base, and 1¼–1⅜ in. in diam.; interzonary band 2–3 lines high; operculum 1–1⅜ in. in diam., 6 lines high, with a velarium 1 line deep; pericarp 2½ lines thick.

9. Eschweilera longipes, nob.: *Lecythis longipes*, Poit. (non Benth.) Mém. Mus. xiii. 144, tab. 1 et tab. 6 A; DC. Prodr. iii. 292; Miq. Linn. xxii. 175; Berg, Linn. xxvii. 453: ramulis rugosis, sulcatis, fusco-ferrugineis, opacis, pruinosis, verruculosis; foliis oblongis, imo obtusis et in petiolum sæpe acutatis, apice in acumen sub-

acutum vel obtusulum abrupte constrictis, subintegris, vel in margine tenui valde revoluto obsoletissime serrulatis, subcoriaceis, supra pallide viridibus, opacis, in nervis semiimmersis sulcatis, reticulatis, costa plana, immersa, fusca, pruinosa, imo crassiore, subtus pallidis, opacis, nervis venisque valde prominentibus, costa striolata, fusca, prominente; petiolo fusco, sulcato, marginato, subtus ruguloso, limbo 10plo breviore : racemis axillaribus et terminalibus; rachi valida, angulata, fusco-ferruginea, scabride pruinosa, 6–15-flora; floribus majusculis, læte violaceis; pedunculis tenuibus, longissimis, striatis, subscabridule velutinis, fuscis; sepalis oblongis, obtusis, crassiusculis, subinæqualibus, rugulosis, carinatis, margine ciliatis; petalis magnis, oblongis, concavis; ovario infero, semigloboso, granulato-rugoso, 2-loculari, ovulis plurimis, erectis, vertice plano, flavide opaco, vix striolato; stylo brevissimo, umbonato: pyxidio depresse turbinato, imo rotundato, infra medium zona calycari e sepalis acutis inflexis linea nexis cincto; vitta interzonali erecta, diametri 8vam partem alta; zona superiore integra; operculo primum pulvinatim convexo, dein late rotundatim umbonato, vitta 3plo altiore, subtus concavo, cum velario intra faucem descendente; pericarpio obsolete 2-loculari; seminibus 2–4, ovali-oblongis, costatis. In Guiana: *v. s. in herb. Mus. Brit.*, Cayenne (*Martin*); *fruct. non vidi.*

A tree 25–30 feet high; the axils of its branchlets $\frac{3}{4}$–1 in. apart; the leaves are $5\frac{1}{2}$–7 in. long, $2\frac{1}{2}$–$3\frac{1}{8}$ in. broad, on a petiole 5–7 lines long, with about 16 pairs of nerves, very prominent beneath, irregular in their direction; the rachis of the raceme is stout, about 4 in. long, its nodes 2–3 lines apart; the slender pedicels, slightly thickened above, are 10-18 lines long; the sepals $2\frac{1}{2}$ lin. long, 2 lin. broad; petals 15 lines long, 10 lines broad; androphorum 1 in. in diam. The pyxidium (Plate LX. figs. 12, 13) is $1\frac{1}{2}$ in. long, 2 in. broad at the calycary zone, which is 6 lines above the base; the interzonary band 3 lines high; the operculum 2 in. in diam., 9 lines high; pericarp apparently thick, with 2, sometimes 4 seeds, 6 lines long, 4 lines broad.

10. Eschweilera lutea, nob.: *Lecythis lutea*, Aubl. Pl. Guian. ii. 721: *Lecythis longipes*, Benth. (non Poit.) in Hook. Journ. Bot. ii. 321: ramulis teretibus, sulcatis, brunneis, opacis, verruculosis; foliis lanceolato-oblongis, imo obtusis, apice sensim longe et acute acuminatis, subintegris, vel ad marginem cartilagineum revolutum punctis obsoletissime serrulatis, subcoriaceis, supra pallide viridibus, opacis, nervis patulo divergentibus, dein adscendentibus, paullo prominulis, reticulatis, costa striolata, subtus pallidis, opacioribus, minutissime granulatis, nervis venisque prominentibus; petiolo fusco, sulcato, subtus corrugulato, limbo 4–5plo breviore: racemo terminali, brevissimo, 3-floro; pedicellis approximatis, calyce 4plo longioribus, tenuibus, apice inflexis; sepalis 5, oblongis, obtusis, crassis, extus convexis, opacis, granulatis, imo gibbosis, marginibus vix tenuibus, obsolete denticulatis; ovario fere omnino supero, 2-loculari, ovulis in quoque loculo 6, e basi erectis, vertice pulvinato, elevato, flavide opaco, corrugulato; stylo late conico; stigmate minuto, papilloso, albido. In Guiana (*Aublet*): *v. s. in herb. Hook.*, Guiana Brit. (*Schomburgk*, 438).

This plant quite agrees with Aublet's short description of his *Lecythis lutea*. It

differs from *Lecythis longipes*, Poit., in its narrower, more lanceolate leaves, gradually much attenuated, less coriaceous, not sulcated in the nervures, with different nervation, upon shorter petioles, in the extremely short rachis of its terminal receme, bearing only 3 approximated flowers upon more slender pedicels, in having only five sepals, an almost superior ovary, with an elevated conical summit. The leaves are $4\frac{1}{2}$–$7\frac{3}{4}$ in. long, $1\frac{1}{8}$–$2\frac{1}{4}$ in. broad, on a petiole $2\frac{1}{2}$–4 lines long; pedicels 16 lines long, slender and striated; sepals 4 lines long, $2\frac{1}{2}$ lines broad; the petals and androphorum are wanting in the specimen I have seen.

11. Eschweilera verruculosa, nob.: *Lecythis verruculosa*, Berg in Mart. Fl. Bras. *l. c.* 502: *Lecythis pedicellaris*, DC. (in parte) Prodr. iii. 292: ramulis gracilibus, cortice pallido, lenticellis verruculosis; foliis sparsis, ovali-oblongis, imo obtusis et in petiolum subito brevissime acutatis, apice sensim attenuatis, subintegris vel in margine tenui revoluto et subundulato obsoletissime serrulatis, tenuiter chartaceis, supra viridibus, subconvexis, minutissime granulatis, nervis plurimis tenuissimis parallelim patule divaricatis, semiimmersis, reticulatis, costa prominula, subtus albide pruinosis, nervis paullo prominulis, costa crassiuscula prominente; petiolo canaliculato, limbo 10–15plo breviore: racemis 3–4 congestis, axillaribus, vel plurimis aggregatis et terminalibus, folio brevioribus; rachi recta, angulosa, flexuosa, subrubescente, 18-30-flora; bracteis ovatis, concavis, deciduis; pedicellis recurvis, subsecundis, rubentibus, corrugulatis; sepalis oblongis, rotundatis, brevibus, patentibus, crassis, corrugulatis, rubenti-viridibus, dorso convexis, margine membranaceis et ciliolatis; petalis obtuse vel rotundato-ovatis, viridi-albis; ovario fere supero, turbinato, grossule verruculoso, 2-loculari, ovulis plurimis e basi erectis, vertice intra discum elevato, conice pulvinato; stylo brevi umbonato. In Brasilia ad Amazonas, in Rio Negro (*Mart.* 2817): *non vidi.*

Dr. Berg states that DeCandolle founded his *Lecythis pedicellaris* on three specimens in Martius's herbarium, consisting of the leaves of this species mixed with the flowers of *Lecythis albiflora*; and as the flowers have long pedicels in the latter, and short ones in the present instance, he suppressed the species named by DeCandolle, and established the perfect plant under the more appropriate designation of *verruculosa*. Berg says it differs from *E. corrugata* in its more membranaceous leaves and racemose flowers. The leaves are $2\frac{1}{2}$–$4\frac{1}{2}$ in. long, $\frac{3}{4}$–2 in. broad, on a petiole 3–4 lines long; the rachis of the raceme is stout and straight, $1\frac{1}{2}$–$4\frac{1}{2}$ in. long, bearing 18 to 30 flowers, the pedicels are $\frac{3}{4}$–1 line long; the flower in bud 6 lines in diam.; calyx expanded 6 lines in diam.; sepals 1 line long.

12. Eschweilera Blanchetiana, nob.: *Lecythis Blanchetiana*, Berg in Mart. Fl. Bras. *l. c.* p. 495; in Linn. xxvii. 455: *Lecythis ovata*, var. *ovalifolia*, Berg in Mart. Fl. Bras. *l. c.* pp. 498 et 618, pl. 7. fig. 154: *Lecythis odoratissima*, Salzm. MSS.: ramulis pallide brunneis, vel cinereis, interrupte striatis, valde verruculosis; foliis ovalibus, imo rotundatis vel obtusis, et in petiolum brevissime acutatis, apice sensim

obtusis, et in acumen breve obtusulum sæpe recurvulum constrictis, subintegris, vel ad marginem cartilagineum subrevolutum punctis obsolete serrulatis, coriaceis, supra pallide viridibus, subopacis, nervis vix prominulis, subtus ochraceo-opacis, nervis venisque reticulatis prominulis; petiolo crassiusculo, limbo 20plo breviore: panicula terminali vel in ramulis novellis racemiformi, folio tertia parte breviore; rachi fusca, angulata, creberrime nodosa; pedicellis calyci subæquilongis, ad nodos articulatis; sepalis inæqualibus, rotatis, oblongis, crassiusculis, rugulosis, margine vix ciliolatis; petalis late ovatis, concavis; ovario semisupero, imo obsolete turbinato, 2-loculari, loculis superioribus, ovulis plurimis e basi radiantibus, vertice intra discum elevato, depresse pulvinato, radiatim striato; stylo late et breviter conico umbonato; stigmate minimo, subgloboso: pyxidio subgloboso, paullo supra medium zona calycari indistincta cincto; vitta interzonali acclive convexa, diametri 4tam partem alta; zona superiore orbiculari, quam inferior paullo minore; operculo depresse pulvinato, umbonato, subtus concavo; pericarpio coriaceo, 2-loculari, loculo uno fere abortivo, altero paucispermo; seminibus ovatis, angulato-subcompressis, pallidis; testa cartilaginea, raphe ramosa signata. In Brasilia, Bahia (sec. Berg, *Blanchet* 382 et 3110 A.): *v. s. in herb. Hook.*, Bahia (*Salzmann*); Bahia (*Talbot*): *fruct. non vidi.*

This species is considered by Berg a variety of *E. ovata*; but it differs in its more apiculated leaves, in its inflorescence, more superior ovary, and its fruit; from *E. tenax* in its smaller, more oval leaves, and almost panicular terminal inflorescence. The leaves are $3\frac{1}{2}$–$4\frac{1}{2}$ in. long, 16–24 lines broad, on a petiole 2–3 lines long, and have about 12 pairs of nerves, with others shorter intermediate, all anastomosing: the rachis of the racemes is 1–$1\frac{1}{4}$ in. long, with flowering nodes 1 line apart; pedicels 2 lines long; flower expanded $1\frac{1}{2}$ in. across; sepals 2 lines long, $1\frac{1}{2}$ line broad; petals 8 lines long, 6 lines broad; ligula of androphorum covered at its base for half its length with staminiferous appendages, with the hood densely echinated with sterile appendages. The pyxidium (Plate LX. fig. 14, from Berg's description) is $1\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. broad; calycary zone 9 lines above the base; interzonary band 4 lines high; operculum $1\frac{1}{4}$ in. in diam., 5 lines high.

13. ESCHWEILERA LÆVIFOLIA, nob.: *Lecythis lævifolia*, Griseb. MSS.: ramulis angulato-striatis, verruculosis; foliis maximis, ovato-oblongis, imo rotundis, apice obtusis, vel in acumen breviusculum subacutum recurvulum attenuatis, subintegris, vel in margine cartilagineo subrevoluto obsolete serratis, valde coriaceis, supra viridulis, opacis, in nervis late sulcatis, nervis parallele subdivergentibus, vix prominulis, crebre reticulatis, subtus ochraceo-pallidioribus, valde opacis, subpruinosis, nervis prominulis, costa striata prominente, imo latiore; petiolo valido, fusco, profunde et anguste canaliculato, subtus corrugato, fusco, limbo 14plo breviore: paniculis terminalibus, folio subbrevioribus; rachi crassiuscula, fusca, ramisque nodosis angulato-striatis; pedicellis longiusculis, validis, sulcatis, obsolete verruculosis; sepalis ovatis, crassiusculis, imo gibbosis, extus pulverulentis, verruculosis, intus flavidis; petalis

ovatis, convexis, submembranaceis, flavis, extus imo subvariolatis; ovario infero, minute lenticellato, 2-loculari, ovulis 4–6 in quoque loculo, erectis, vertice depresse pulvinato, stylo brevi crasso umbonato: pyxidio turbinato, imo obconico, sulcato, sub medium zona calycari e sepalis 6 linea nexis cincto; vitta interzonali acclive convexa, diametri dimidium alta; zona superiore circulari, integra; operculo ignoto. In ins. Trinidad: *v. s. in herb. Hook.*, in flore et in fr. immaturo (*Prestoe*); idem (*Cruger*, 302); idem in sylvis (*Purdie*, 37); *v. fr. s. in Mus. Kew.* (*Purdie*).

The axils are $\frac{3}{4}$–1 in. apart; the leaves are $4\frac{1}{2}$–12 in. long, $3\frac{7}{8}$–$6\frac{1}{4}$ in. broad, on a petiole 4–8 lines long, and with about 13–15 pairs of nerves, with others shorter and intermediate; the branches of the panicle, or rachis of the racemes are 2–3 in. long; with nodes 2–4 lines apart; the pedicels are 3 lines long; the calyx expanded is 6 lines across; the sepals $2\frac{1}{2}$ lines long and broad; the petals in the bud 9 lines long, 6 lines broad; the androphorum, with a fleshy bare ligula 4 lines wide, has a broader semiglobose head, very convex, very densely echinated within by innumerable sterile appendices; the style is $\frac{1}{2}$ line long; the pyxidium (Plate LX. fig. 15) is a little gibbous by the semi-abortion of one of the cells, is $1\frac{1}{4}$ in. long without the operculum; the calycary zone is 7 lines above the base, $1\frac{1}{2}$ in. in diam.; the interzonary band, very convex, is 8–9 lines high; the upper zone entire, $1\frac{1}{8}$ in. in diameter.

14. Eschweilera ovata, Mart.: *Lecythis ovata*, Camb. Fl. Bras. Mer. ii. 378, tab. 158; Berg in Mart. Fl. Br. *l. c.* p. 467 (exc. syn. plur.); Linn. xxvii. 454: ramulis ruguloso, interrupte striatis, pallide brunneis, vel glauco-opacis, lenticellis majusculis flavidis verruculosis; foliis ovali-ellipticis, imo obtusis, aut acutioribus, supra medium sensim rotundiusculis, apice in acumen acutum vel obtusum canaliculatim recurvum constrictis, in margine paullo revoluto obsolete serratis, aut fere integris, subcoriaceis, supra pallide viridibus, sublucentibus, nervis prominulis, reticulatis, subtus pallidioribus, opacis, nervis tenuibus venisque paullo prominulis, costa striata prominente; petiolo canaliculato, marginato, granulatim ruguloso, limbo 12plo breviore: racemis in ramulis novellis terminalibus, solitariis vel binis, folio æquilongis; rachi tenui, tereti, striata, lenticellata; floribus majusculis, odoratis; pedicellis tenuibus, longiusculis, fuscis, striatis, patentibus vel nutantibus; sepalis oblongis, obtusis, carinatis, marginibus crenulatis et serrato-denticulatis; petalis oblongis, concavis, margine denticulatis; ovario infero, turbinato, pilosulo vel pruinoso, 2-loculari, ovulis in quoque loculo, erectis, vertice depresse pulvinato, radiatim striato; stylo subbrevi, imo conico, sensim tenuiore; stigmate minimo albo: pyxidio immaturo parvo, subgloboso, paullo supra medium zona calycari e sepalis 6 acutis radiantibus linea nexis cincto; vitta interzonali angusta, erecta, diametri 5tam partem alta; zona superiore inferiorem æquante, orbiculari; operculo depresse pulvinato, convexo, longe et obtuse umbonato, intus concavo, cum velario crassiusculo intra faucem descendente; pericarpio coriaceo, 2-loculari, dissepimento fere evanido, aut gibbose unilaterali; seminibus paucis, hilo basali affixis, lævibus vel obsolete costatis. In Brasilia: *v. s. in hb. variis*, circa Pernambuco (*Gardner*, 1023); *v. fr. s. in Mus. Kew.*, Pernambuco (*Gardner*).

A small tree, about 20 feet high, abundant in sandy woods about 10 miles from Pernambuco. St.-Hilaire found it as far south as Espiritu Santo; and the specimens agree well with his drawing. The axils of its branches are $\frac{3}{4}$–1 in. apart; the leaves are $2\frac{1}{2}$–$4\frac{1}{4}$ in. long, $1\frac{1}{4}$–$2\frac{1}{8}$ in. broad, on a petiole 2–4 lines long, with about 12 pairs of nerves and others intermediate anastomosed; the rachis of the terminal raceme is $1\frac{3}{4}$ in. long, with prominent nodes 2–3 lin. apart; pedicels gradually shortening from 8 to 4 lines long; flower in bud $\frac{1}{2}$ in. broad, globular; sepals $2\frac{1}{2}$ lin. long, 2 lin. broad; petals 10 lin. long, 5 lin. broad; style $1\frac{1}{2}$ line long; pyxidium (Plate LX. fig. 16) $1\frac{1}{8}$ in. high, $1\frac{3}{8}$ in. broad; calycary zone $\frac{1}{2}$ in. above base; interzonal band 3 lines high; upper zone and operculum $1\frac{3}{8}$ in. in diam.; operculum $\frac{5}{8}$ in. high, its velarium 1 in. in diam. and 1 line deep; pericarp 2-celled.

15. Eschweilera Luschnatii, nob.: *Lecythis Luschnatii*, Berg in Mart. Fl. Bras. *l. c.* p. 499, tab. 74: ramulis teretibus, pallide brunneis, rugulosis et verruculosis; foliis elliptico-oblongis vel anguste oblongis, imo obtusis et petiolum canaliculatim marginantibus, apice breviter et obtusule acuminatis, sæpe complicatis, integris, vel ad marginem cartilagineum paullulo revolutum obsoletissime crenulatis, rigide chartaceis, supra pallide viridibus, sublucentibus, nervis venisque reticulatis prominulis, ad costam tenuem prominulam sulcatis, subtus luride brunnescentibus, opacis, nervis venisque prominulis, costa striolata prominente; petiolo subtenui, patente, marginibus incurvis profunde canaliculato, subtus ruguloso, limbo 20plo breviore: racemis in ramulis axillaribus, vel pluribus congestis et terminalibus, simplicibus, folio dimidio brevioribus; pedicellis tenuibus, recurvis, calyce 4–6plo longioribus, pruinosis; sepalis oblongis, fuscis, opace pruinosis, imo gibbosis, margine membranaceo ciliato-denticulatis; petalis oblongis, marginibus denticulatis; ovario semisupero, turbinato, sulcato, pruinose irrorato, 2-loculari, ovulis in loculis pluribus, e basi erectis, vertice pulvinato, striato; stylo brevi, conico, obtuso: pyxidio immaturo depresse globoso, imo obconice turbinato, ad medium zona calycari e sepalis auctis divaricatis cincto; vitta interzonali brevi, subconvexa, diametri decimam partem alta; zona superiore circulari; operculo convexo, pulvinato, apice alte et obtuse umbonato, cum velario intra faucem descendente; pericarpio verruculoso, striato, punctis flavidis maculato, 2-loculari. In Brasilia (sec. Berg), in prov. Ilheos (*Luschnatt*, 65): *v. s. in hb. Hook.* sine loco (*Burchell*, 9883 bis, cum fructu immaturo).

A middling-sized tree, with the axils of its branchlets about $\frac{1}{2}$ in. apart; leaves $3\frac{1}{4}$–$4\frac{3}{4}$ in. long, $1\frac{1}{4}$–$1\frac{7}{8}$ in. broad, on a petiole $2\frac{1}{2}$–3 lin. long, and with about 12 pairs of nerves, with others shorter and intermediate, all anastomosed; rachis of panicle $2\frac{1}{2}$ in. long, its branchlets 9 lines long, each 1–2–3-flowered; slender pedicel 6–12 lines long; flower in bud 6 lines broad; sepals 2 lines long; petals 8 lines long; immature pyxidium (Plate LX. fig. 17) 10 lines long; calycary zone 5 lines from base, $1\frac{1}{8}$ in. in diam.; interzonal band 2 lines high; operculum 1 in. in diam., 3 lines high. Martius states that its fruit resembles that of *L. Idatimon*, Aubl., but is a little longer.

16. Eschweilera platycarpa, nob.: *Lecythis platycarpa*, Poit. Mém. Mus. xiii. p. 146; Berg in Mart. Fl. Br. *l. c.* p. 618: *Lecythis longipes*, var. *platycarpa*, DC. Prodr. iii.

292: ramulis brunneis vel rubescentibus, lenticellis elongatis flavidis verruculosis; foliis ovato-oblongis vel oblongis, imo subrotundatis et in petiolum brevissime acutatis, apice in acumen acutum subito attenuatis, crenulato-serratis, vel in margine cartilagineo paullo revoluto punctis obsoletissime serrulatis, rigide chartaceis, supra pallide viridibus, opacis, nervis tenuibus, subimmersis, arcuatim divaricatis, crebre reticulatis, subtus opace flavidioribus, costa striolata nervis venisque prominentibus; petiolo validiusculo, fusco, tereti, marginato, limbo 16–20plo breviore: racemis axillaribus et terminalibus, folio dimidio brevioribus; rachi valida, geniculatim flexuosa, valde nodosa, pluriflora; floribus majusculis; pedicellis in alabastro brevibus, demum longioribus, cum nodis articulatis, apice crassioribus, fuscis, pruinosis, striatis; sepalis oblongis, obtusulis, pruinosis, convexis, crassiusculis, gibbosis, medio tuberculatis, marginibus membranaceis et ciliolatis; petalis ovatis, albis; androphoro luteo; ovario semiinfero, turbinato, 6-sulcato, 2-loculari, ovulis paucis e basi erectis, vertice elevato, pulvinato, radiatim striato; stylo brevi, obtuse conico; stigmate obsolete 2-lobato: pyxidio subparvo, depresse lentiformi, imo convexo, ad medium zona calycari e sepalis inflexis linea nexis cincto; vitta interzonali brevissima; operculo circulari depresse convexo, umbonato, intus concavo, cum velario angustissimo intra faucem descendente aucto; pericarpio coriaceo, 2-loculari, loculis monospermis. In Guiana: *v. s. in hb. Mus. Brit.* in flore, Cayenne (*Martin*); Guiana (*Anderson*); *in hb. Hook. et Mus. Brit.*, Karaouary (*Sagot*, 1139).

A large suffruticose tree, found in savannas round the town of Cayenne. It is easily distinguished from *E. longipes* by its larger and smoother leaves, longer inflorescence, more granulated rachis, more slender pedicels, and other characters. Its leaves are 5–7$\frac{3}{4}$ in. long, 2$\frac{1}{4}$–3$\frac{1}{4}$ in. broad, on a stout petiole 3–5 lines long, and have about 12 pairs of slender nerves, with several others shorter intervening, all anastomosing; the rachis of the raceme is about 2$\frac{1}{2}$ in. long, with prominent geniculate nodes 2–3 lines apart, with pedicels articulated on the nodes 2 lines long in the bud, 10 lines long in the flower; the sepals are 3 lines long, 2 lines broad; the flower in bud is globular, 1 in. in diam.; the pyxidium (Plate LX. fig. 18) is 1$\frac{1}{2}$ in. in diam., 6 lines high.

17. Eschweilera parvifolia, Mart. in DC. Prod. iii. 293: *Lecythis parvifolia*, Berg in Mart. Fl. Br. *l. c.* p. 496 et 618; Linn. xxvii. 455: ramulis teretiusculis, pruinosis; foliis ovato-oblongis, imo obtusis, apice sensim acuminatis, integerrimis, supra pallidis, lævigatis, nitidis, nervis venisque reticulatis vix visibilibus, costa prominente, subtus opacis, nervis tenuibus venisque prominulis, costa prominente; petiolo tenui, canaliculato, limbo 10plo breviore: racemis axillaribus et terminalibus, folio brevioribus; rachi gracili, 6–13-flora; floribus mediocribus; sepalis subinæqualibus, ovato-oblongis, obtusatis, pedicello dimidio brevioribus, imo gibbis, margine ciliolatis; petalis ovato-oblongis; ovario semiinfero, 2-loculari, stylo breviusculo obtuso umbonato: pyxidio parvo, oblongato, imo turbinato, paullo supra medium zona calycari e sepalis recurvatis linea nexis cincto; vitta interzonali altiuscule erecta; zona superiore circulari, inferiori æquilata; operculo altiusculo, convexo, obtuse umbonato; pericarpio coriaceo, rugoso, obsolete 2-loculari, abortu

monospermo. In Amazonas, fl. Solimoes, Ega, in sylvis inundatis prope ripas lacus (*Pöppig*, 2507); *non vidi.*

The above description is taken from that of Berg, and must not be confounded with *L. parviflora*, Aubl. It is a tree 30–40 feet high; the leaves are 2–6½ in. long, 8–36 lines broad, on a petiole 5–7 lines long; and they have about 10 pairs of imbedded nerves, arcuately anastomosed and reticulated, scarcely visible above, little prominent below: the rachis of the raceme is 1–1½ in. long; the flower in bud ½ in. in diam.; sepals 1½ line long; petals 6 lines long; style 1 line long: the pyxidium (Plate LX. fig. 21) is 14 lines long, 6 lines broad; calycary zone 9 lines above the base; interzonary band 2 lines high; operculum 3½ lines high.

18. Eschweilera parviflora, nob.: *Lecythis parviflora*, Aubl. Pl. Gu. ii. 717, tab. 285 et 287; DC. Prodr. iii. 292; Berg in Linn. xxvii. 453: ramis dichotomis, ramulis tenuibus, fusco brunneis, striatis, verruculosis; foliis oblongis, imo obtusis, apice in acumen subacutum abrupte attenuatis, integris vel in margine cartilagineo subrevoluto punctis obsoletissime serrulatis, chartaceis, supra pallide viridibus, subnitidis, nervis tenuissimis subimmersis, reticulatis, costa tenui carinata flavida prominula, subtus fulvide pallidioribus, opacis, nervis venisque prominulis, costa sulcata prominente; petiolo fusco, subtenui, marginato, subtus corruguloso, limbo 12plo breviore: paniculis axillaribus et terminalibus, folio subæquilongis, ramosis; rachi subtenui compressa, nodosa, pruinosa, ramis subtenuibus; floribus parvis, odoratis; pedicellis tenuibus, brevibus, minutissime granulosis: pyxidio ovato, supra medium zona calycari e sepalis divaricatis in lineam nexis cincto; vitta interzonali diametri quintam partem alta, acclive convexa; zona superiore circulari; operculo vittæ æquialto, convexe pulvinato, apice obtuse umbonato, intus concavo, dissepimento tenui persistente, cum velario intra faucem longe descendente; pericarpio coriaceo, incomplete 2-loculari, loculis 1-spermis; seminibus oblongis, longitudinaliter striatis, hilo basali affixis. In Guiana: *v. s. in hb. Mus. Brit.*, Cayenne (*Aublet*).

A shrub with a trunk 3 feet high; the axils of its branchlets ¾ in. apart; the leaves are 3–5 in. long, 1¼–1½ in. broad, on a petiole 3–4 lin. long, and with about 12 pairs of nerves divaricating and ascending near the margin, with others shorter and intermediate, all anastomosing; the panicle is 2 in. long, the slender pedicels 2 lin. long: the pyxidium (Plate LX. fig. 19) is 1 inch long; the calycary zone 7 lines above the base, and 10 lin. in diam.; the interzonal band is 2 lin. high; the operculum 8 lin. in diam., 3 lines high, with a pendent velarium 3 lines deep; the seeds are 9 lin. long, 4 lin. broad.

19. Eschweilera micrantha, nob.: *Lecythis micrantha*, Berg in Linn. xxvii. 454: ramulis subtenuibus brunneis, interrupte striolatis, opacis, remote verruculosis; foliis oblongis vel lanceolato-oblongis, imo obtusis aut sæpe acutioribus, apicem versus sensim angustioribus et in acumen longiusculum sæpe acutissimum vel obtusulum sensim attenuatis, integris vel in margine cartilagineo valde revoluto punctis obsoletissime serrulatis, chartaceis, supra læviusculis, subopace viridibus,

nervis patentim divaricatis et curvatis, semiimmersis, reticulatis, subtus ochraceo-opacis, nervis venisque prominulis, costa prominente; petiolo fusco, canaliculato, marginato, subtus granoso-ruguloso, limbo 22plo breviore: panicula in ramis novellis tenuibus terminali; rachi tenui, striata, fusco-pruinosa; floribus parvis; pedicellis tenuibus, calyce duplo longioribus; sepalis parvis, rotundato-ovatis, valde convexis, imo gibbosis, rotatis, marginibus membranaceis, ciliatis; petalis obovatis, concavis; ovario semiinfero, granuloso, 2-loculari, ovulis in quoque loculo 2, e basi erectis, vertice pulvinatim elevato, radiatim striato, stylo brevissimo apiculato. In Guiana Brit. interiore: *v. s. in hb. variis*, Rio Branco, Parimo (*Schomb.* 865).

This scarcely differs from *L. parviflora* of Aubl.; but its leaves are more pallid, with a somewhat different venation, with rather smaller flowers; the leaves are $3\frac{1}{2}$–$5\frac{3}{4}$ in. long, $1\frac{1}{8}$–2 in. broad, on a petiole 2–3 lines long, and with about 14 pairs of nerves, with others shorter and intermediate, all anastomosed; rachis of racemes $1\frac{3}{4}$ in. long; pedicels $\frac{1}{2}$–1 lin. long; flowers in bud 3 lines in diam.; sepals $\frac{1}{2}$ line long and broad; petals 4 lines long.

20. Eschweilera Siberiana, Mart.: *Lecythis Siberiana*, Berg in Mart. Fl. Br. *l. c.* p. 501: frutex, ramulis verruculosis; foliis ovalibus vel ovato-oblongis, imo rotundatis et in petiolum breviter acutatis, apice breviter acuminatis, subintegris vel in marginibus undulatis obsoletissime subserrulatis aut serrulatis, chartaceis, supra nervis tenuibus venisque reticulatis parum prominulis, subtus nervis costaque prominulis; petiolo canaliculato, limbo 12plo breviore: racemis axillaribus, folio dimidio brevioribus; rachi gracilenta, flexuosa, pauciflora, pruinosa; floribus majusculis; sepalis parvis, inæqualibus, rotundatis; petalis 12plo longioribus, obovatis; ovario subinfero, 2-loculari, ovulis pluribus basilaribus, vertice subplano, stylo brevissimo vix umbonato: pyxidio subparvo, subgloboso, imo turbinatim rotundo, ad medium zona calycari e sepalis linea nexis cincto; vitta interzonali subconvexa; zona superiore convexa, integra; operculo orbiculari, convexo. In Brasilia ad Pará (*Siber*): *non vidi.*

A low tree or shrub, with leaves 3–$4\frac{1}{2}$ in. long, 16–30 lines broad, on a petiole 3–4 lines long; rachis of raceme 2–$2\frac{1}{2}$ in. long; sepals $\frac{1}{2}$–1 line long; petals 1 in. long; pyxidium (Plate LX. fig. 22) 10 lines long, 12 lines broad; calycary zone 5 lines above base; interzonal band 2 lines high; operculum 10 lines broad, 3 lines high. Berg states that this species is near *Chytroma Spruceana*, differing in its shorter petioles and its 2-celled ovary.

21. Eschweilera nana, nob.: *Lecythis nana*, Berg in Mart. Fl. Bras. *l. c.* p. 617: humilis, caule suffruticoso, dense verrucoso; foliis sparsis, subsessilibus, ovatis vel ovato-oblongis, imo obtusis vel subcordatis, apice apiculatis, serrulatis, glabris, supra violaceo-viridibus, glaucescentibus, nervis tenuibus venisque reticulatis, prominulis, subtus costa nervisque prominentibus, petiolis vix ullis: racemis axillaribus et terminalibus, folio longioribus; rachi valida, angulosa, flexuosa, nigro-violacea, glabra, 8–10-flora; pedicellis validis, alabastro brevioribus; sepalis oblongis, obtusis, inæqualibus, pedicello duplo longioribus, pallide marginatis, denticulatis, dorso subcarinatis; petalis obovatis, imo subcoalitis, luteis, sepalis duplo longioribus; andro-

phoro majusculo; ovario infero, 2-loculari; stylo crasso, conico: pyxidio 2–3-spermo. In Brasilia meridionali, prope Camacuam (*Riedel*): *non vidi*.

A small shrub, according to Riedel, not more than a foot high, found by him in the south of Matto-grosso, not far from the northern limit of Paraguay. It is a species remarkable for its low stature and rather large sessile leaves, which are $2\frac{1}{2}$–$7\frac{1}{2}$ in. long, $\frac{3}{4}$–$4\frac{3}{4}$ in. broad; its racemes are 4–7 in. long; the stout pedicels 2–3 lines long; sepals 4–5 lines long, 3–4 lines broad; petals 9–10 lines long; androphorum 8 lines broad; style 1 line long. According to Berg, it differs from his *Lecythis coriacea* in its low stature, subsessile leaves, racemes longer than they, larger and more obtuse sepals, and pyxidium with few seeds.

22. Eschweilera lurida, nob.: ramulis fusco- vel cinereo-brunneis, substriatis, lenticellis oblongis flavidis creberrime verruculosis; foliis lanceolato- vel elliptico-oblongis, imo rotundatis, supra medium sensim angustioribus, apice in acumen longiusculum acutum subrepente et valde attenuatis, margine denticulis parvis duplicato-serratis, tenuiter chartaceis, supra planis, luride viridibus, opacis, nervis tenuissimis, vix prominulis, creberrime reticulatis, subtus ferrugineo-pulverulentis, valde opacis, nervis stramineis paullo prominulis, costa tenui prominente; petiolo subtenui, canaliculato, ruguloso, limbo 14plo breviore: racemis in ramulis novellis terminalibus, folio multo brevioribus, rachi crassiuscula, pauciflora; pedicello in fructu incrassato, valido, longiusculo: pyxidio (adhuc immaturo) turbinato, imo obconico, medio zona calycari e sepalis acutis divaricatis linea nexis cincto; vitta interzonali alta, pulvinatim valde convexa; zona superiore circulari, quam calycaris multo minore; operculo convexo, radiatim striato, umbone alto et conico terminato, undique lenticellis flavidis maculato. In Brasilia septentrionali: *v. pl. s.* sine flore, cum fructu immaturo (*Burchell*, 10,000).

A species near *E. nana*, but apparently of much taller growth: its axils $\frac{3}{4}$–1 in. apart, the leaves are 4–$7\frac{1}{2}$ in. long, $1\frac{1}{2}$–$2\frac{1}{2}$ in. broad, on a petiole 3–5 lines long; the rachis of the raceme is 1 in. long, bearing the cicatrices of several flowers; the thickish pedicel is 3 lines long; the pyxidium (Plate LX. fig. 23) is 1 in. long, $\frac{3}{4}$ in. broad at the calycary zone, formed of 6 acute persistent sepals, each 5 lines long, 4 lines broad; interzonary band 3 lines high; upper zone and operculum 5 lines in diam., the latter pulvinate depressed, 4 lines high, with an elevated umbonate point.

23. Eschweilera Sagotiana, nob.: *Lecythis parviflora*, Sagot, MS. (non Aubl.): ramis validis, fuscis, rugulosis; ramulis subteretibus, griseo- vel rubro-brunneis, cortice rimoso, lenticellato-verruculosis; foliis ovalibus vel ovato-ellipticis, imo obtusis aut acutioribus, apice in acumen brevissimum acutum subito apiculatis, subintegris, vel in margine tenuiter cartilagineo et subrevoluto obsolete crenatis, coriaceis, supra pallidissimis, opacis, nervis immersis, reticulatis, costa prominente, subtus valde fulvo-opacis, nervis venis costaque sulcata prominulis; petiolo subvalido, rubidulo, late marginato, extus ruguloso, limbo 10–16plo breviore: paniculis axillaribus et terminalibus, folio brevioribus, simpliciter ramosis, rachi compressa, angulato-striata, nodulosa; pedicellis tenuibus, imo 2-bracteolatis, calyce duplo longioribus; bracteolis

ovatis, membranaceis, caducis; floribus subparvis, odoratis; sepalis oblongis, rotundatis, patentibus, imo crassis, gibbosis, granulato-rugulosis, margine late submembranaceis et subdenticulatis; petalis triplo longioribus, obovatis, concavis, inæqualibus, albis et flavide punctulatis; androphoro luteo; ovario fere supero, imo umbilicatim 6-lobo, 2-loculari, ovulis in quoque loculo 3, erectis, vertice intra discum elevato, depresse pulvinato, radiatim striato, stylo brevi obtuso umbonato. In Guiana: *v. pl. s. in hb. Mus. Brit. et Kew.*, Karaouary (*Sagot*, 1104, sub *Lec. parviflora*).

Its leaves are $3\frac{1}{2}$–$5\frac{1}{2}$ in. long, $1\frac{3}{4}$–$2\frac{3}{4}$ in. broad, on a petiole 3–4 lines long, and with about 8–10 pairs of nerves arcuately conjoined with others shorter, very reticulated; rachis of racemes slender, 2–$2\frac{1}{2}$ in. long, branches $\frac{1}{2}$ in. long, bearing 2 flowers; pedicels slender, $2\frac{1}{2}$–3 lines long; bracts 1 line long; sepals $1\frac{1}{2}$ line long, 1 line broad; petals 5 lines long; androphorum 5 lines in diameter.

This species in no way approaches *E. parviflora*; it differs in its more corrugated branches, its much larger, broader, more oval, and very coriaceous leaves, which are pallid and smooth above, with nerves entirely immersed, ochreous below, with very prominent midrib and nerves, with thicker corrugated petioles, in the branches of the panicle compressed, flat, stouter, ferruginous, subpolished and striated, and in its white (not golden-coloured) petals.

24. Eschweilera macrophylla, nob.: *Lecythis macrophylla*, Berg in Mart. Fl. Br. *l. c.* p. 616: *Lecythis Wullschlægeliana*, Berg, *l. c.* p. 493: ramulis teretibus, pallide brunneis, vel fuscioribus, opacis, lenticellis flavis verruculosis, junioribus teretibus sublævibus; foliis oblongis, imo obtusis, apice in acumen angustum sæpe recurvum subito attenuatis, subintegris vel in margine cartilagineo revoluto punctis obsoletissime serratis, subcoriaceis, supra pallide viridibus, nervis tenuibus divaricato-adscendentibus vix prominulis, crebre reticulatis, subtus pallidioribus, opacis, costa valida nervisque flavidulis prominentibus; petiolo crassiusculo, sulcato et marginato, corrugato-granuloso, limbo 15–24plo breviore: racemis axillaribus et terminalibus, folio dimidio brevioribus, rachi subtenui, valde geniculata, angulata, subflexuosa, longe nodosa, fusca; floribus majusculis, circa 8–12; pedicellis subtenuibus, calyce 2–3plo longioribus, scabride granulosis; sepalis oblongis, obtusis, convexis, imo valde gibbosis, fuscis, subpruinosis, margine ciliatis; petalis flavidis; ovario semi-infero, ruguloso, 2-loculari, ovulis pluribus basifixis, vertice elevato, depresse pulvinato, stylo crasso brevi umbonato. In Guiana Gallica (*Poiteau*); in Guiana Batava, Paramaribo (*Wullschlægel*, 1471): *v. s. in herb. Mus. Brit.*, Guiana Batava (*Anderson*).

As Anderson's specimen, also from Dutch Guiana, agrees with Berg's *L. macrophylla*, as well as with his *L. Wullschlægelia*, I have considered them to be specifically identical; the latter is said to be a small tree; its leaves are $4\frac{1}{2}$–$7\frac{3}{4}$ in. long, $2\frac{1}{2}$–$3\frac{3}{4}$ in. broad, on a petiole 3–4 lines long, and have about 12 pairs of nerves, with others shorter and intermediate, all anastomosing; the slender pedicels are 9 lines long; the sepals 3 lines long; the petals $1\frac{1}{2}$ in. long; androphorum 1 in. in diameter.

This species is near *E. platycarpa*; but the rachis of the inflorescence is more slender, more geniculated, the pedicels more slender, shorter, and the sepals smaller.

25. Eschweilera flaccida, nob.: ramulis subvirgatis, teretibus, cinerascenti-brunneis, striolatis, sublævibus; foliis late oblongis, vel elliptico-oblongis, imo obtusatis, apice in acumen subacutum subito constrictis, in margine tenui revoluto punctis obsolete serrulatis, flaccide submembranaceis, supra læte viridibus, opacis, minute glauco-granulatis, nervis tenuissimis venisque reticulatis prominulis, costa prominente, subtus fere concoloribus, opacioribus, costa striolata nervis venisque prominentibus, sub lente minutissime granulatis; petiolo fusco, limbo 12–14plo breviore: racemis in ramulis novellis terminalibus, rachi brevi, rugosa, crebre nodosa; floribus majusculis; pedicellis calyce longioribus, superne crassioribus, angulato-sulcatis, minute granulosis; sepalis æqualibus, oblongis, obtusatis, crassis, fuscis, opacis, medio rugulosis, imo gibbosis, erectiusculis; petalis androphoroque sicco flavis; ovario semiinfero, turbinato, 2-loculari, ovulis in quoque loculo 6, uniseriatis, e basi adscendentibus, radiantibus, vertice elevato, depresse pulvinato, radiatim striato, stylo brevi conico umbonato; stigmate minimo, niveo. In Guiana Gallica: *v. s. in herb. Mus. Brit.*, Cayenne (*Van Rohr*).

A species near *E. macrophylla*, differing in its slender branchlets, broader leaves, which are flaccidly membranaceous, in its short terminal racemes, with closely approximated flowers. The leaves are $4\frac{3}{4}$–8 in. long, $1\frac{7}{8}$–$3\frac{3}{8}$ in. broad, on a petiole 4–6 lines long; the raceme is $1\frac{1}{4}$ in. long, with nodes $\frac{1}{2}$ line apart; the pedicels are 5 lines long; the sepals 4 lines long, $1\frac{1}{2}$ line broad; the androphorum 9 lines in diameter.

26. Eschweilera simplex, nob.: ramulis subtenuibus, teretibus, paullo flexuosis, pallide brunneis, interrupte striolatis, verruculosis; foliis subremotis, elongato-oblongis vel lanceolato-oblongis, imo obtusis vel sensim subacutis, apice in acumen longiuscule angustum obtusulum subrepente attenuatis, integerrimis, vel obsolete crenulatis, margine subcartilagineo et subrevoluto, chartaceis, supra pallide et læte viridibus, subopacis, nervis tenuissimis subimmersis, parallele divergentibus, reticulatis, costa vix prominula, subtus concoloribus, costa granulatim punctata nervis venisque prominentibus; petiolo semitereti, fusco, ruguloso, limbo 40–50plo breviore: racemo terminali, folio 6plo breviore; rachi tenui, 1-flora; floribus majusculis. In Guiana: *v. s. in herb. Mus. Brit.*, Cayenne (*Martin*).

A species near *E. lutea*, but easily recognized by its slender branches, its distant leaves on extremely short petioles, and its slender, single, terminal flower. Its axils are $1\frac{1}{2}$–2 in. apart; the leaves are 8–$9\frac{1}{2}$ in. long, $1\frac{1}{2}$–2 in. broad, on a petiole 1 line long, and with about 12 pairs of nerves, with 1 longer and 2 shorter intermediate nervures; the rachis of the terminal raceme is about 1 in. long, bearing on its summit a single flower, the slender pedicel of which is $1\frac{1}{4}$ in. long; the petals are about $\frac{3}{4}$ in. long, the androphorum 7 lines in diameter, all pulverulent outside. As there is only a single flower glued to the sheet, I could not ascertain its structure.

27. Eschweilera pachysepala, Mart.: *Lecythis pachysepala*, Spruce, Berg in Mart. Fl. Br. *l. c.* p. 494: ramulis teretibus, subtenuibus, cinereo- vel pallide brunneis, rugoso-striatis, tuberculis parvis verruculosis; foliis elongato-oblongis, imo obtusis et in petiolum sensim acutioribus, apice in acumen angustum longiusculum sæpe canaliculatim recurvum attenuatis, marginibus subrevolutis, punctis obsolete crenulatis, chartaceis, supra pallide viridibus, opacis, minutissime granulatis, nervis patentim divaricatis et adscendenter curvatis, paullo prominulis, crebre reticulatis, subtus pallidiusculis, flavidioribus, valde opacis, subpulverulentis, nervis venisque pallidioribus prominentibus, costa carinata prominente; petiolo fusco, canaliculato, corrugulato, limbo 12plo breviore: racemis axillaribus, vel plurimis in panicula terminalibus; rachi geniculatim flexuosa, longe nodosa, angulatim striata, opaca, pulverulente granulosa; pedicellis longis, fuscis, angulatis, striolatis, sursum incrassatis; sepalis majusculis, oblongis, obtusis, subinæqualibus, valde incrassatis, convexis, pruinosis, corrugulatis, margine tenui sinuato-denticulatis; petalis majusculis, obovatis, siccis flavis, membranaceis, venosis, margine ciliatis; ovario semisupero, 2-loculari, ovulis pluribus e basi dissepimenti radiatim erectis, vertice intra discum pulvinatim elevato, corrugato-striato, stylo conico brevissimo umbonato. In Guiana et Brasilia septentr.: *v. s. in herb. Mus. Brit.*, Cayenne (*Van Rohr*); *in hb. variis*, Rio Negro (*Spruce*, 1912).

This is a tree 40–50 feet high, growing in a gapo (inundated land) between Barra and Barcellos; it is one of the kinds whose fruit is called *Macacarecuya*. The leaves are $3\frac{1}{2}$–$6\frac{1}{2}$ in. long, $1\frac{1}{8}$–$2\frac{3}{8}$ in. broad, on a petiole 4–6 lines long, and have about 14 pairs of nerves, with others shorter and intermediate, all anastomosing; the raceme is 3–6 in. long, with nodes $\frac{1}{2}$–1 line long, and $\frac{1}{4}$–$\frac{1}{2}$ in. apart; pedicels 8–13 lines long; sepals 2–4 lines long, $1\frac{1}{2}$–3 lines broad; petals 9 lines long, of a red colour; androphorum 6 lines in diam., of a pale sulphur; flower expanded 2 in. broad.

28. Eschweilera paniculata, nob.: *Lecythis paniculata*, Berg in Mart. Fl. Br. *l. c.* p. 501: ramulis cortice rimoso, fusco-ferrugineis, pruinosis, rugoso-striatis, subverruculosis; foliis elongato- vel angustius oblongis, imo obtusis, apice in acumen longiusculum obtusulum subito attenuatis, integris, vel ad marginem cartilagineum revolutum integris aut obsoletissime serrulatis, subcoriaceis, supra læte viridibus, vix lucentibus, aut opacis, nervis venisque reticulatis subimmersis, subtus cinnamomeo-pallidioribus, valde opacis, nervis venisque prominulis, costa validiuscula prominente; petiolo subvalido, marginato, fusco, pulverulento, corruguloso-striato, limbo 14–16plo breviore: panicula terminali, ramosa, ramis rectis, patentibus, rachi longe nodosa; pedicellis nutantibus, angulatis, ferrugineis, pruinoso-opacis; sepalis calyci æquilongis, acute oblongis, crassiusculis, pruinosis, imo gibbosis; petalis oblongis, subinæqualibus, albis; ovario infero, 2-loculari, ovulis in quoque loculo paucis, erectis, vertice rotundatim pulvinato, radiatim granuloso, stylo brevi apiculato. In Amazonas: *v. s. in herb. variis*, S. Gabriel, Panuré, Rio Uahupes (*Spruce*, 2610).

A tree 40 feet high, growing in low woods near the banks of the river; its leaves are $4\frac{1}{2}$–8 in. long, $1\frac{3}{8}$–$2\frac{1}{4}$ in. broad, on a petiole 5–6 lines long; the main rachis of the panicle is straight, 4–6 in. long, its branches 1–2 in. long, 8–12-flowered, pedicels $1\frac{1}{2}$–2 lines long, about $\frac{1}{4}$–$\frac{1}{2}$ in. apart; sepals $2\frac{1}{2}$ lines long; petals 5 lines long, 3 lines broad; androphorum 4 lines in diameter.

29. Eschweilera tenuifolia, nob.: *Lecythis tenuifolia*, Berg in Mart. Fl. Br. *l. c.* p. 502: ramulis ferrugineo- vel pallide brunneis, cortice valde rimoso, interrupte striatis, pruinosis, crebre lenticellato-verruculosis; foliis oblongis vel elliptico-oblongis, imo obtusis et in petiolum sensim vel abrupte breviter acutatis, apice in acumen angustum sæpe recurvulum acuminatis, marginibus subcrenatis, vix serrulatis, rigide chartaceis, junioribus tenuioribus, supra læte viridibus, opacis, costa paullo prominente, nervis tenuibus, subpatulis, vix prominulis, reticulatis, subtus fere concoloribus, vel luride pallidioribus, opacis, costa striolata prominente, nervis venisque paullo prominulis; petiolo subcorrugato, canaliculato, opaco, limbo 13–15plo breviore: racemis axillaribus et terminalibus, folio brevioribus; rachi tenui, remotiusculc et longe nodosa, angulato-striata, verruculosa, pauciflora; pedicellis brevibus, imo articulatis; sepalis ovatis, extus rugulosis, pruinoso- vel strigoso-granulatis, marginibus membranaceis, ciliolatis; petalis obovato-oblongis, flavis, punctis albidis maculatis, ciliato-denticulatis; ovario semiinfero, breviter turbinato, flavido-maculato, 2-loculari, ovulis plurimis e basi radiantibus, vertice elevato, depresse pulvinato, radiatim striato, stylo brevi conico umbonato. In Brasilia septentr.: *v. s. in herb. variis*, Rio Negro inter Barcellos et Barra (*Spruce*, 1884 et 2031); *in herb. Hook.*, Santarem (*Spruce*, 698).

The specimens from Rio Negro and Santarem, if not specifically distinct, form two well-marked varieties, the one having broader, more shortly acuminated, more membranaceous, greener leaves, on shorter petioles. The former is a bushy tree, 30 feet high; the leaves are 5–$7\frac{1}{4}$ in. long, $1\frac{3}{4}$–$2\frac{1}{2}$ in. broad, on a petiole 4–6 lines long, and with about 5 pairs of nerves, and others intermediate, all anastomosed; the rachis of the raceme is $2\frac{1}{2}$–$3\frac{1}{2}$ in. long, with nodes $\frac{1}{2}$ line long, equal to the pedicels articulated upon them; the flower expanded is 2 in. in diam.; the sepals are $1\frac{1}{2}$ line long and broad; the petals 10–12 lines long, 7–9 lines broad; the androphorum is 6 lines in diameter. In the Santarem plant the leaves are $3\frac{1}{4}$–5 in. long, $1\frac{1}{8}$–$1\frac{3}{4}$ in. broad, on a petiole 2–3 lines long; the rachis of the raceme 3–4 in. long.

30. Eschweilera subglandulosa, nob.: *Lecythis subglandulosa*, Steud., Berg. in Linn. xxvii. 459: ramulis subvalidis, subflexuosis, brunneis, opacis, subangulatis, striatis, lenticellato-verruculosis; foliis ovato-oblongis, imo rotundatis, canaliculatis, et in petiolum breviter acutatis, apice sensim obtusioribus et in acumen acutum vel obtusum sæpe recurvatum attenuatis, ad marginem cartilagineum valde revolutum punctis obsolete serrulatis, valde coriaceis, supra pallide viridibus, opacis, subconvexis, nervis divaricatis longe intra marginem adscendentibus subimmersis, venis valde reticulatis omnino immersis, circa costam prominulam sulcatis, subtus

ochraceo- vel ferrugineo-pallidis, valde opacis, nervis immersis, venis foveatim areolatis, costa imo crassiore prominente; petiolo valido, canaliculato, marginibus inflexis, ruguloso, limbo 15plo breviore: panicula terminali, folio subæquilonga, ramosa, ramis simplicibus, fusce rufescentibus; floribus majusculis; pedicellis sulcato-striatis, calyce duplo longioribus; sepalis oblongis, obtusis, crassiusculis, extus rugulosis, imo gibbosis, marginibus tenuibus et subdenticulatis; petalis oblongis; ovario fere omnino supero, distincte 2-loculari, ovulis in quoque loculo 4, ad basin radiatim affixis, erectis, vertice intra discum valde elevato, pulvinato, radiatim striato, stylo alto late conico terminato. In Guiana Batava: *v. s. in hb. Mus. Brit. et Hook.*, Surinam (*Hostmann*, 186 et 886).

A very distinct species, easily recognized by its smooth, coriaceous, pale, broadly ovate leaves, and its terminal paniculated inflorescence; the axils of its branchlets are $\frac{3}{4}$–1 in. apart; the leaves are 6–$7\frac{1}{4}$ in. long, $2\frac{3}{4}$–$3\frac{1}{2}$ in. broad, on a petiole 5–6 lin. long, and with about 10 pairs of nerves, with others shorter and intermediate, all anastomosing; the terminal panicle is 4 in. long, its branches $1\frac{1}{2}$–2 in. long; its pedicels 3 lin. long; the flower expanded is $1\frac{3}{4}$–2 in. broad; its sepals 2 lin. long; petals 8 lin. long, 6 lin. broad.

31. Eschweilera pallida, nob.: ramulis fusco-brunneis, ruguloso-striatis, lenticellis flavidis verruculosis; foliis oblongis, imo rotundatis, apice in acumen breve mucronulatum subrecurvum subito attenuatis, subintegris vel in margine cartilagineo revoluto punctis obsolete serrulatis, chartaceis, supra pallidis, opacis, planis, costa tenui flavida carinata subprominente, nervis semiimmersis, subtus pallidissimis, costa striata, nervis tenuibus venisque transversim reticulatis prominulis; petiolo fusco, tereti, canaliculato, marginibus inflexis, subtus ruguloso, limbo 16plo breviore: racemo terminali, folio breviore; rachi subvalida, flexuosa, angulato-striata, cum nodis subremotis longiuscule prominulis; pedicellis fuscis, roride pulverulentis; sepalis ovatis, obtusis, extus rugulosis et pulverulentis, imo gibbose incrassatis, margine membranaceo; ovario semisupero, 2-loculari, ovulis pluribus basilaribus, vertice elevato, depresse pulvinato, planiusculo, radiatim striato, stylo fere obsoleto umbonato. In Guiana: *v. s. in hb. Mus. Brit.*, Cayenne (*Martin*); Karaouary (*Sagot*, 269).

The axils of its branchlets are $\frac{3}{4}$–1 in. apart; the leaves are $3\frac{3}{4}$–$6\frac{1}{2}$ in. long, $1\frac{3}{4}$–$3\frac{1}{4}$ in. broad, on a petiole 3–4 lines long, and with about 10 pairs of nerves; the rachis of the raceme about 2 in. long, stout, with geniculate prominent nodes 1 line long, and 5 lines apart; pedicels 7 lin. long; sepals 3 lines long; bud $\frac{3}{4}$ inch in diameter.

32. Eschweilera obversa, nob.: *Lecythis obversa*, Berg in Mart. Fl. Bras. *l. c.* p. 503: ramulis subtenuibus, subflexuosis, striato-sulcatis, pruinosis, minute verruculosis; foliis oblongo-ovatis, imo obtusis, aut sæpe angustioribus et in petiolum breviter acutatis, apice in acumen acutum canaliculatim reflexum attenuatis, chartaceis, margine cartilagineo subrevoluto punctis obsoletissime crenulato-serrulatis, supra viridibus, sublucentibus, sub lente minute granulosis, nervis costaque tenuibus pro-

minulis, reticulatis, subtus brunnescenti-pallidioribus, opacis, nervis venisque vix prominulis, costa striolata prominente ; petiolo plano, marginato, subtus corrugulato, limbo 12–16plo breviore : panicula ramosa, terminali, vel racemis in ramulis novellis terminalibus, folio brevioribus, paucifloris, rachi flexuosa, longiuscule nodosa ; floribus majusculis ; pedicellis sulcatis, calyce vix longioribus, cinereo-pruinosis ; sepalis subrotundatis, margine membranaceo ciliolatis ; petalis majusculis, luteis, oblongis, rotundatis ; ovario breviter turbinato, cinereo-pruinoso, subinfero, 2-loculari, ovulis paucis e basi radiantibus, suberectis, vertice plane pulvinato, stylo brevi conico umbonato. In Amazonas : *v. s. in hb. variis*, Santarem (*Spruce*, 826 et 892).

This is a tree about 30 feet high, growing, I presume, near the banks of the Amazonas, near Santarem, as its vernacular name is *Castanheira das aguas* ; its flowers are white, with a strong smell of primroses. The leaves are 2–5½ in. long, ⅞–2 in. broad, on a petiole 2–3 lines long, with about 12 pairs of nerves, with several others shorter and intermediate, all anastomosing ; the racemes are 1½–2 in. long ; the pedicels 2 lines long ; the sepals 1½ line long ; the petals 9 lines long, 5 lines broad ; the androphorum 6 lines in diameter.

33. Eschweilera elegans, nob. : *Lecythis elegans*, Berg in Mart. Fl. Br. *l. c.* p. 499 : ramulis teneris, irregulariter striatis, cinereo- vel fulvide pulverulentis ; foliis lanceolato-oblongis, vel elongato-oblongis, imo obtusis, apice a medio sensim angustioribus et in acumen angustum subacutum sensim attenuatis, subintegris, vel ad marginem cartilagineum revolutum punctis obsolete serrulatis, chartaceis, supra pallide viridibus, opacis, sub lente minutissime granulatis, nervis plurimis divaricatis versus marginem longe adscendentibus venisque reticulatis immersis, subtus fulvide pallidioribus, valde opacis, nervis vix prominulis, costa prominente ; petiolo marginato, corrugulato, limbo 20–24plo breviore : panicula e racemis 3 congestis terminali, folio breviore ; rachi tenuissima, crebre nodulosa, subgeniculata, striata, circa 20-flora ; pedicellis calyci æquilongis ; sepalis parvis, rotundato-ovatis, extus pruinosis, imo gibbosis ; petalis rotundatis, luteis, flavide maculatis ; androphoro aurantiaco ; ovario semiinfero, 2-loculari, ovulis in quoque loculo paucis, e basi erectis, vertice pulvinatim elevato, striato, stylo brevi conico umbonato. In Amazonas : *v. s. in hb. Mus. Brit. et Hook.*, Rio Negro, inter Barcellos et S. Isabel (*Spruce*, 1665).

This species, according to Berg, is near *E. micrantha* ; but I cannot perceive such an approximation. It is a slender tree, 25 feet high ; its leaves are 3½–5 in. long, 1–1⅞ in. broad, on a petiole 2–2½ lines long, and with about 10 pairs of nerves, with others intermediate, all anastomosed ; rachis of the racemes ¾–1¼ in. long ; flowers in bud 5 lines in diam. ; sepals 2 lines long and broad ; the flower, when softened, becomes pale and semiglutinous, as in *E. amara*.

34. Eschweilera albiflora, nob. : *Lecythis albiflora*, DC., Prod. iii. 292 ; Berg in Mart. Fl. Br. *l. c.* p. 509 ; in Linn. xxvii. 455 : ramulis pallide brunneis, glaucis, striatis, junioribus tenuioribus ; foliis oblongis, imo sensim acutis, apice gradatim attenuatis,

longiuscule et acute acuminatis, rarius obtusioribus, margine tenui vix revoluto subintegris vel obsolete crenatis, tenuiter chartaceis, supra pallide viridibus, opacis, planis, nervis divaricatis subimmersis vix prominulis, reticulatis, costa tenui prominula, subtus luride brunnescentibus, opacis, costa nervis venisque flavidis prominulis; petiolo subtenui, canaliculato, limbo 10plo breviore: paniculis axillaribus et terminalibus, apice subramulosis, folio brevioribus; rachi fusca, nodosa; pedicellis longiusculis; sepalis oblongo-ovatis, crassis, fuscis, carinatis, rugosis, imo gibbosis, marginibus membranaceis; ovario infero, 2-loculari, vertice valde depresso, radiatim striato, stylo brevi conico obtuso umbonato. In prov. Amazonas: *v. s. in hb. Hook.*, Rio Negro in sylvis (*Martius*).

A tree 50–60 feet high; the axils of its branchlets $\frac{1}{2}$ in. apart; leaves luridly brown below, 4–8 in. long, $1\frac{1}{4}$–$3\frac{1}{4}$ in. broad, on a petiole 5–7 lin. long, and with from 15–18 pairs of nerves, with others shorter intermediate, all anastomosing; panicle 4 in. long, its branches $1\frac{1}{2}$–$2\frac{1}{2}$ in. long; slender pedicels 6–9 lines long; sepals 3 lines long, $1\frac{1}{2}$ line broad; petals 10 lines long; androphorum 6 lines in diameter.

35. Eschweilera Reideliana, nob.: *Lecythis Reideliana*, Berg in Mart. Fl. Br. *l. c.* p. 618: ramulis patentibus, pruinosis; foliis ovato-oblongis, imo latioribus et in petiolum breviter et subito acutatis, apice obtusis et breviter acuminatis, obsolete serratis, chartaceis, supra glabris, nitidis, nervis erecto-patulis, remotiusculis, subimmersis, arcuatim nexis, venis reticulatis, subtus fuscescentibus, opacis, nervis venis costaque prominentibus; petiolo limbo 10–14plo breviore: inflorescentia racemosa; floribus majusculis; pedicellis brevissimis; sepalis rotundatis vel ovato-rotundatis, inæqualibus, pruinosis, margine ciliolatis; petalis albis; androphoro luteo; ovario semiinfero, 2-loculari, multiovulato, vertice convexo, striato, stylo brevissimo umbonato. In Amazonas, prope Santarem, in humidis inundatis (*Reidel*): *non vidi.*

A tree 30 feet high; leaves $3\frac{1}{2}$–7 in. long, $1\frac{3}{4}$–$3\frac{1}{4}$ in. broad, on a petiole 4–6 lin. long; flower in bud 8 lin. in diam.; sepals 1–$1\frac{1}{2}$ line long, $1\frac{1}{2}$ line broad; petals 10 lin. long; androphorum 6 lin. in diam. It is said to differ from *E. albiflora* in its leaves gradually acuminated, in its smaller pedicels and flowers, and its rounded ciliolated sepals.

36. Eschweilera trochiformis, nob.: ramulis crassiusculis, rectis, teretibus, rufo-brunneis, opacis, pruinosis, ruguloso-striatis, verruculosis; foliis late ovatis, imo truncatis vel obtuse rotundatis, aut subcordatis et subito breviter ad petiolum decurrentibus, apice rotundatis et emarginatis, marginibus revolutis obsoletissime crenulatis, coriaceis, valde convexis, et ad nervos late sulcatis, supra pallide viridibus, paullo opacis, e reticulatione creberrima foveatim rugulosis, nervis tenuibus, remotiusculis, semiimmersis, divergentibus, arcuatim nexis, venis transversim reticulatis, costa subconvexa, imo latiore, rufule pruinosa, subtus sordide pallidis, glauco-opacis et roride pruinosis, costa valida, rugulosa, nervisque valde prominentibus, venis prominulis; petiolo valido, profunde canaliculato, alte marginato, limbo 20plo breviore: racemo terminali vel axillari, folio paullo breviore, rachi valida, helvole

pruinosa, compresse angulata, transversim corrugulata, flexuose crasse nodosa, pauci- vel pluriflora; floribus majusculis; pedicellis cum nodis articulatis, crassis, striatis, pruinosis; sepalis pedicello æquilongis, valde imbricatis, ovatis, submembranaceis, demum subcrassis, granulatim pruinosis, marginibus submembranaceis ciliato-denticulatis; petalis oblongis, submembranaceis, albis, siccis fulvidis, punctulatis, concavis; ovario semisupero, tuberculato, 2-loculari, ovulis pluribus basilaribus erectis, vertice intra discum pulvinato, stylo conico umbonato, stigmate minuto subgloboso: pyxidio turbinis lusorii majusculi mole; cætera ignota. In Brasilia, prov. Pernambuco: *v. s. in hb. Mus. Brit. et Kew.*, Serra da batalha, Rio Preto (*Gardner*, 2876); prov. Goyaz (*Gardner*, 3189).

According to Gardner this is a small tree, about 10 feet high, growing in the upland campos, with white flowers, and a fruit about the size of a large top; the structure of the ovary shows that it belongs to this genus. The axils of its branches are $\frac{1}{2}$–1 in. apart; the leaves have a very peculiar aspect, are $4\frac{1}{2}$–$6\frac{1}{4}$ in. long, $3\frac{1}{4}$–5 in. broad, on a thick broad petiole 2–3 lines long, and have about 14 pairs of nerves, with others intermediate, all anastomosed; the rachis of the terminal raceme is 2–10 in. long, with thick prominent nodes 2–5 lines apart and 1–2 lines long; the pedicels are 1 line long; the flower in bud 10 lines in diam.; the inferior portion of the ovary is 2 lines long and 3 lines broad.

37. Eschweilera cordata, nob.: *Lecythis cordata*, Berg in Linn. xxvii. 457: ramulis teretiusculis, sulcatis, pallide fuscis, brunneo-pulverulentis; foliis rotundato-ovalibus aut suborbicularibus, imo cordatis, apice rotundatis et retusis, aut in acumen brevissimum obtusulum recurvulum repente constrictis, marginibus repandis et integerrimis, pergamineis, supra pallidis, glauco-opacis, nervis semiimmersis, tenuibus, divergentibus, marginem versus adscendentibus, reticulatis, subtus nitidioribus, nervis venisque prominentibus; petiolo vix ullo, valido, canaliculato: racemis terminalibus, folio longioribus; rachi valida, angulata, pulverulenta, 24-flora; pedicellis crassis, calycem æquantibus, bracteolis caducis; sepalis ovatis, obtusis, subæqualibus; ovario semiinfero, 2-loculari, vertice conico-elevato, pulviniformi, pulverulento, radiatim striato; stylo brevi. In Venezuela, ad miss. Angustura Manas de Barcelona (*Moritz*, 585): *non vidi*.

This species, in the size and shape of its leaves, much resembles *Lecythis Ollaria* from the same neighbourhood; but the structure of its 2-locular ovary shows clearly that it belongs to the genus *Eschweilera*: it differs little from *E. tenax* except in its more sessile leaves. The leaves are said to be $2\frac{1}{4}$–$2\frac{3}{8}$ in. long, $1\frac{1}{2}$–$2\frac{1}{8}$ in. broad, almost sessile; the rachis of the raceme is above 4 in. long; pedicels 3 lines long; sepals 3 lines long; petals $\frac{3}{4}$ in. long.

38. Eschweilera tenax, nob.: *Lecythis tenax*, Moritz, Berg in Linn. xxvii. 456: cortice tenacissimo; ramulis validis, interrupte striatis, fusco- vel cinereo-brunneis, obsolete verruculosis; foliis ovatis vel oblongo-ovatis, imo rotundatis, sæpe subcordatis, apice in acumen breve obtusulum recurvum abrupte constrictis, marginibus revolutis cartilagineis subcrenatis, vel e punctis fuscis obsolete serratis,

coriaceis, supra convexis, pallide viridibus, opacis, nervis divaricatis venisque reticulatis immersis, ad costam prominulam sulcatis, subtus pallide brunneis vel luride ochraceis, opacis, costa striata, crebre reticulatis, nervis venisque prominentibus; petiolo valido, fusco, canaliculato, marginibus inflexis, rugoso, limbo 10–14plo breviore: racemis axillaribus et terminalibus, folio brevioribus; rachi subvalida, angulata, crebriflora; floribus flavis; pedicellis subvalidis, calyce 3plo longioribus, recurvis; sepalis rotundato-oblongis, subæqualibus, rotatis, extus carinatis et granulosis, imo glandulose gibbosis; petalis obovatis, citrinis, carnosulis, margine erosulis; ovario semiinfero, granulis flavidis creberrime punctulato, 2-loculari, ovulis in quoque loculo circ. 5, e basi erectis, vertice valde elevato, conico, striato; stylo brevi, conico; stigmate minimo, globoso. In Venezuela: *v. s. in herb. Mus. Brit. et Hook.*, Colonia Tovar, in sylvis humidis et frigidulis (*Moritz*, 1880).

A tree found in moist woods: the axils of its branchlets are about $\frac{1}{2}$ in. apart; the pallid coriaceous leaves are $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, 1–$1\frac{7}{8}$ in. broad, on a petiole 2–3 lin. long, and with about 10 pairs of divaricating ascending nerves arcuately anastomosing; the rachis of the raceme is 2–$2\frac{1}{2}$ in. long, with prominent nodes 1–2 lin. apart; the pedicels 6–8 lines long; the calyx expanded 8 lines across; the sepals 3 lines long, 2 lines broad; the larger petals 1 in. long; the androphorum 8 lines in diameter, and twice that length, its ligula bare, 6 lines long, its antheriferous basal appendages crowded, very short, those inside the hood linear, pointed, sterile, densely echinated, adpressed.

The bark of the tree is very tough, and is used for cordage.

39. Eschweilera Moritziana, nob.: ramulis pallidis, opacis, rectis, tenuiter striolatis, ad axillas compressis; foliis late ellipticis vel oblongis, imo obtusis, apice in acumen subobtusum sæpe revolutum constrictis, integris vel marginibus cartilagineis revolutis crenulatis obsoletissime serrulatis, tenuiter chartaceis, supra pallide viridibus, subopacis, sub lente minute granulosis, nervis tenuibus paullo divaricatis vix prominulis, reticulatis, in costa tenui sulcatis, subtus fere concoloribus, opacis, costa striata valde prominente, nervis venisque stramineis prominentibus; petiolo subtenui, fusco,canaliculato, marginato, corrugulato, limbo 16plo breviore: inflorescentia racemosa, pedicellis brevibus, angulato-sulcatis, granulosis; sepalis 6 ovato-oblongis, valde imbricatis, fuscis, convexis, crebre granuloso-verrucosis, marginibus tenuibus, crenulatis; petalis 5 vel 6 late oblongis, medio carnosis, concavis, extus subgranulosis; ovario infero, verruculoso, 2-loculari, ovulis in quoque loculo 4–6 e basi erectis, vertice concavo; stylo tenuiter tereti, sepalis longiore. In Venezuela: *v. s. in herb. Mus. Brit.*, circa Chupé, Cape Augustin (*Moritz*, 548).

A small tree, called *Naranjillo*. The axils of its branchlets are $\frac{1}{4}$–1 in. apart; the leaves are $6\frac{1}{2}$–8 in. long, $2\frac{3}{4}$–$3\frac{3}{4}$ in. broad, on a petiole 4–6 lin. long, and have about 10 pairs of nerves, with others intermediate, all anastomosed; the pedicels are 6 lines long; sepals 3 lin. long, 2 lin. broad; petals 8 lin. long, 5 lin. broad; the androphorum is 6 lines in diameter; basal ring staminigerous, and the incurved head of the androphorum is charged with longish adpressed appendages, mostly antheriferous.

40. Eschweilera laurifolia: *Lecythis ovata*, var. *laurifolia*, Berg in Mart. Fl. Br. *l. c.* p. 498: ramulis fusco- vel cinereo-brunneis, rugosis, verruculosis; foliis ovalibus aut elliptico-ovatis, imo rotundatis, in apice rotundo subito emarginatis, vel in acumen obtusum breve subrepente attenuatis, subintegris, marginibus revolutis obsolete serrulatis, rigide chartaceis, supra viridibus, subopacis, nervis tenuibus, subtus luride brunnescentibus, opacis, nervis venis costaque prominentibus; petiolo fusco, profunde sulcato, marginato, limbo 15plo breviore: racemis in ramulis novellis brevibus, terminalibus, folio tertia brevioribus; rachi tenui, subflexuosa, nodosa, fusca, circ. 10-flora; floribus parvis; pedicellis calyce longioribus, tenuibus; sepalis acute ovatis, subinæqualibus, imo gibbosis, carinatis, rugosis, marginibus membranaceis et ciliatis; ovario turbinato, semiinfero, 2-loculari, ovulis plurimis e basi erectis, vertice elevato, pulvinato, stylo conico obtuse umbonato. In Brasilia: *v. s. in herb. Hook.* sine loco (*Sello*).

The axils of the branchlets are $\frac{3}{4}$ in. apart; the leaves are $2\frac{1}{2}$–$4\frac{1}{2}$ in. long, 1–2 in. broad, on a petiole 2–3 lin. long; the rachis of the raceme is $1\frac{1}{2}$ in. long; the pedicels 3–5 lines long; sepals 2–3 lin. long; petals 8 lin. long.

This species is certainly remote from *L. ovata*, differing in its less-coriaceous leaves, darker and luridly brown below, rounded at base, much shorter raceme, with fewer and much shorter flowers, on shorter and more slender pedicels.

41. Eschweilera gracilis, nob.: *Lecythis ovata*, var. *obscura*, Berg in Mart. Fl. Br. *l. c.* p. 498: ramulis tenuibus, fusco-brunneis, rugulosis; foliis ellipticis vel elongato-oblongis, imo acutis vel subobtusis, apice sensim acutis aut repente acuminatis, subintegris vel ad marginem subcartilagineum punctis obsolete serrulatis, flaccide chartaceis, supra pallide viridibus, granulatim opacis, nervis tenuibus semiimmersis, reticulatis, subtus rufule brunnescentibus, pulverulento-opacis, costa prominente, nervis venisque reticulatis parum prominulis; petiolo tenui, profunde canaliculato, fusco, ruguloso, limbo 12plo breviore: racemis in ramulis novellis terminalibus aut e foliis sæpe caducis paniculam efformantibus, ramulis remotiusculis, gracillimis; rachi folio dimidio breviore, flexuosa, tenui, compressa, nodulosa, 8–10-flora, bracteolis acute linearibus, caducis. In Brasilia: *v. s. in hb. Hook.* (*Sello*, 383, cum flore unico effœto).

The leaves of this slender plant are 2–$3\frac{1}{2}$ in. long, 10–16 lines broad, on a petiole 2–3 lin. long; the terminal rachis on the young leafless branchlets is 1–$1\frac{1}{2}$ in. long.

It bears no resemblance to *E. ovata*, to which Berg referred it as a variety.

42. Eschweilera acuminata, nob.: *Lecythis ovata*, var. *acuminata*, Berg. in Mart. Fl. Br. *l. c.* p. 497: ramulis tenuibus, teretibus, fuscis, cinereo-opacis, substriolatis, verruculosis; foliis ellipticis vel elliptico-oblongis, imo sensim subacutis et ibi canaliculatis, apice longiuscule et acute acuminatis, subintegris vel in marginibus revolutis punctis obsolete serrulatis, chartaceis, supra pallide viridibus, opacis, nervis divaricatim adscendentibus paullo prominulis, reticulatis, costa tenui prominula, subtus

fere concoloribus, opacioribus, costa nervis venisque prominentibus; petiolo tenuissimo, profunde canaliculato, ruguloso, limbo 12plo breviore: racemis axillaribus, folio 4plo brevioribus; rachi tenui, pauciflora; pedicellis brevibus, angulatis; sepalis oblongo-ovatis, fuscis, carinatis, subrugulosis, marginibus anguste membranaceis et ciliatis; petalis oblongis, concavis, submembranaceis, sinuato-denticulatis; ovario infero, 2-loculari, ovulis in quoque loculo 3 ad basin dissepimenti erectis, vertice depresso, stylo brevi, stigmate minuto apiculato. In Brasilia: *v. s. in hb. Hook.*, prov. Bahia (*Sello*, 479).

The branchlets are slender, with axils 3–4 lines apart; the leaves are $2\frac{1}{2}$–3 in. long, 1–$1\frac{1}{4}$ in. broad, on a petiole $2\frac{1}{2}$–3 lines long, and have about 9 pairs of nerves, with others shorter and intermediate, all anastomosed: the raceme is $\frac{1}{2}$–1 in. long, bearing 6–9 flowers, on pedicels (including the base of the ovary) 3 lines long; the sepals 2 lines long, 1 line broad; the flower in bud $\frac{1}{2}$ in. broad; style $\frac{1}{2}$ line long.

43. Eschweilera? odora, nob.: *Lecythis odora*, Pöpp., Berg in Mart. Fl. Br. *l. c.* p. 492: arbor procera, ramulis pulverulento-tomentellis; foliis ovali-oblongis, imo obtusis vel breviter acutis, apice abrupte acuminatis, obsoletissime serrulatis, subcoriaceis, supra subnitidis, nervis pluribus subimpressis, reticulatis, subtus nervis costatim prominentibus venisque reticulatis prominulis, costa crassa; petiolo valido, anguste canaliculato, subpuberulo: racemis interdum paniculatis, folio dimidio brevioribus; rachi gracili, flexuosa, 13–25-flora; pedicellis calyce 5plo longioribus; floribus majusculis, odoratis, niveis; sepalis subinæqualibus, ovatis, acutis aut obtusis, imo gibbosis, carinatis, pruinoso-pulverulentis, margine ciliolatis; petalis obtuse obovatis, ciliolatis; ovario semiinfero, 2-loculari, ovulis pluribus uniseriatim radiantibus, vertice altiusculo, pulvinato, stylo brevi conico umbonato. In Amazonas ad Ega in sylvis (*Pöppig*, 2754): *non vidi.*

This species very probably belongs rather to *Jugastrum*, as according to Berg it is near his *Lecythis coriacea*, differing in its thinner leaves, abruptly acuminated, its shorter racemes, longer pedicels, and its sepals. It forms a tree 50 feet high; its leaves are $5\frac{3}{4}$–9 in. long, $2\frac{1}{2}$–4 in. broad, on a stout petiole, and with about 15–20 pairs of nerves; the rachis of the raceme is $2\frac{1}{2}$–5 in. long; the pedicels 6–8 lin. long; sepals $1\frac{1}{2}$ lin. long; petals 6 lin. long; androphorum 5 lin. in diameter.

44. Eschweilera acuminatissima, nob.: *Lecythis acuminatissima*, Berg in Mart. Fl. Br. *l. c.* p. 494; Linn. xxvii. 455: ramulis gracilibus, pruinoso-pilosulis; foliis oblongis vel lanceolato-oblongis, imo acutis, apice in acumen longum et angustissimum abrupte attenuatis, subintegris vel in marginibus subrepandis punctis obsoletissime serrulatis, submembranaceis, supra pallide virentibus, subnitidis, nervis divaricato-adscendentibus arcuatim nexis, subtus brunnescentibus, opacis, nervis venisque reticulatis prominentibus, costa utrinque prominente; petiolo limbo 9–14plo breviore: racemis axillaribus et terminalibus, folio brevioribus; rachi angulosa, flexuosa; pedicellis calyce duplo longioribus; sepalis oblongis, obtusis, imo gibbis,

carinatis, roseis, margine ciliolatis; petalis obovatis, obtusis, pallide sulfureis, apice denticulatis; ovario semiinfero, 2-loculari, vertice alte pulvinato. In Amazonas, ad Ega (*Pöppig*, 2710): *non vidi*.

This species is said by Berg to be near *E. pilosa*, Pöpp.; it forms a tree 25 feet high, with a very hard wood. The leaves are $4\frac{3}{8}$–8 in. long, $1\frac{1}{3}$–$2\frac{3}{4}$ in. broad, on a petiole 6–7 lin. long; the racemes are 18–28 lin. long; the pedicels 6–9 lin. long; the sepals 5 lin. long; the petals 10 lin. long.

45. Eschweilera bracteosa, nob.: *Lecythis bracteosa*, Pöpp., Berg in Mart. Fl. Br. *l. c.* p. 495; Linn. xxvii. 455: arbor procera; foliis ovali-oblongis, imo breviter acutatis, apice breviter acutis, marginibus leviter late crenatis, coriaceis, supra nervis pluribus parallelis divergenti-adscendentibus parum prominulis, reticulatis, subtus pallidioribus, nervis costato-prominentibus; petiolo valido, recurvulo, limbo 12plo breviore: racemis axillaribus aut paniculatim terminalibus, folio paullo brevioribus; rachi nutante, angulata, roride pulverulenta, densiflora; pedicellis longis, pendulis, imo 3-bracteatis; bracteis ovalibus, pedicello triplo brevioribus; floribus majusculis; sepalis subæqualibus, rotundatis, extus pruinosis, margine ciliatis; petalis triplo longioribus, obovatis, pulverulentis, ciliolatis, albis; ovario infero, 2-loculari, ovulis 8–10 e basi uniserialiter radiantibus, vertice plano, stylo brevi umbonato. In Amazonas ad Ega, in ripa lacus (*Pöppig*, 2565): *non vidi*.

A lofty tree, in its habit, its leaves with a peculiar venation, its inflorescence with 3-bracteated pendulous pedicels, its approximated large flowers much resembling a *Bertholletia* or a *Couratari*, but with an ovary corresponding to *Eschweilera*; the leaves are 5–7 in. long, $2\frac{1}{3}$–$2\frac{3}{4}$ in. broad, on a petiole 5–7 lines long, and have about 13 to 17 pairs of diverging and ascending nerves costately prominent beneath, with others shorter and intermediate, all anastomosing; the raceme is 4–5 in. long, with pedicels 14 lines long, and bracts 3–5 lines long; the sepals 3 lin. long; petals 8–15 lin. long.

46. Eschweilera pilosa, nob.: *Lecythis pilosa*, Pöpp., Berg in Mart. Fl. Br. *l. c.* p. 500; Linn. xxvii. 455: arborea, ramulis cortice rimoso, pulverulento-puberulis; foliis ovali-oblongis, imo obtusis vel breviter acutis, apice acuminatis, integerrimis, chartaceis, supra obscure viridibus, nitidis, nervis divaricatis prominulis, reticulatis, costa planiuscula, subtus pallidioribus, opacis, nervis venis costaque prominentibus; petiolo valido, limbo 20–24plo breviore: racemis folio 5plo brevioribus, sub-10-floris; pedicellis validis, calyce duplo longioribus, pulverulentis, pendulis; sepalis inæqualibus, ovatis vel ovali-oblongis, obtusis, ciliolatis; petalis oblongis, obtusis, ciliolatis, violaceo-purpureis, siccis flavidis; ovario fere supero, 2-loculari, multiovulato, vertice alto. In Amazonas, ad Ega, in lacus littoribus (*Pöppig*, 2669): *non vidi*.

A tree 30 feet high; its leaves are 5–8 in. long, 2–$3\frac{1}{4}$ in. broad, on a petiole 2–4 lin. long, with about 15 pairs of nerves, with others shorter intervening, all anastomosing; the rachis of the raceme is 1–$1\frac{1}{2}$ in. long; its stout pedicels 6–14 lines long; sepals 3–6 lin. long; petals 22 lin. long, 11 lin. broad; androphorum 1 in. in diameter.

7. JUGASTRUM. (Plate XXXV. A.)

The peculiar features which separate this genus from *Lecythis* are still more decided than in the two preceding genera; they have been already amply described (*antè*, p. 167); and it is only necessary now to give its generic diagnosis.

JUGASTRUM, nob.

Lecythis (in parte) auct.

Calycis adnati *sepala* et *petala* ut in *Lecythide*. *Androphorum* mediocre, petaloideum, carnosum, imo semiannulare, subcupulare, hic ad *discum* epigynum annularem cum unguibus petalorum interpositis agglutinatum, et uno latere in ligulam æquilatam expansum, intus appendiculis numerosissimis ultra basin ligulæ extensis brevibus subclavatis staminigeris creberrimis onustum; ligula summo nuda, sensim incurva, *galea* inversa, sellæformi, crasse carnosa, supra convexa, extremitate laciniata, intus appendiculis basilaribus longioribus staminigeris densissime echinata. *Stamina* parva, appendiculis insita: *filamenta* brevissima filiformia; *antheræ* parvæ, ovatæ, 2-lobæ, collateraliter adnatæ, extus longitudinaliter hiantes. *Ovarium* inferum, turbinatum, vertice intra discum planum elevatum, semper 2-loculare; *ovula* in quoque loculo plurima, sessilia, e basi erecta, 2–3-serialia, anatropa: *stylus* brevis, conicus: *stigma* minutum, globosum, papillosum. *Pyxidium* subparvum, turbinatum vel subglobosum, circa medium *zona calycari* e sepalis linea nexis cinctum; *vitta interzonali* sæpius angusta; *zona superiore* subcirculari; *operculo* isti conformi, mox solubili et deciduo, supra depresse pulvinato vel convexiore, sæpius umbonato, infra valde concavo, vestigio dissepimenti signato, cum *velario* intra marginem prope faucem descendente munito; *pericarpio* (operculoque) subtenuiter coriaceo, primum 2-loculari, dissepimento mox sæpius evanido: *semina* plurima (10–20) bi- triseriatim basi affixa, erecta, sicca cuneato-cylindrica, pressione acute 3–4-angulata, apice truncata et convexiuscula; *testa* tenuiter coriacea, extus lævis, intus impresso-granosa; *raphe* in fibras spirales multidivisa per testam totam immersa; *integumentum internum* tenuiter membranaceum, ad testam adhærens: *embryo* testæ forma, exalbuminosus, cereo-carnosus, crocinus, extus guttato-granosus, medio ad angulum ventralem mamilla longitudinaliter fissa signatus, homogeneus, *neorhiza* interna cuneato-oblonga apice obtuse truncata, imo subcuneata, medio anguli ventralis *plumula* prominente mammæformi marginem fere tegente, extus *exorhiza* subcrassa undique cincta. (*Germinatio* ita fit: *plumulæ* prolongatio per fissuram lateralem exorhizæ horizontaliter propulsa et in *cauliculum* squamosum aucta, dein adscendit, et eodem tempore a neorhizæ incremento basali, *radicella* descendens apparet: hoc modo *planta nova* oritur.)

Arbores *Americæ intertropicæ*, Lecythidis *habitu*.

1. JUGASTRUM CORIACEUM, nob.: *Lecythis coriacea*, DC. Prodr. iii. 291 (non Seem. Bot. Her. 126); Berg in Mart. Fl. Br. *l. c.* p. 491 (tab. 72, fructus); Linn. xxvii. 459: *Eschweilera coriacea*, Mart. MS.: arbor procera, ramulis teretibus, subvalidis, rugoso-striatis, fusco-brunneis, lenticellato-verruculosis; foliis majusculis, ovato-oblongis vel elongato-oblongis, imo obtusis, apice obtusis vel latioribus et in acumen acutum aut obtusulum recurvulum subito attenuatis, in marginibus subcartilagineis revolutis paullo crenulatis, vel sæpius integrioribus et punctis obsoletissime serrulatis, chartaceis, supra pallide viridibus, paullo opacis, sub lente minutissime granulatis, nervis divaricatis, longe adscendentibus, immersis, reticulatis, costa tenui paullo prominente, subtus ferrugineo- vel brunneo-opacis, nervis venisque prominulis, costa validiore, prominente, sulcata; petiolo fusco, canaliculato, ruguloso,

limbo 12plo breviore: paniculis terminalibus, pauciramosis, folio triplo brevioribus; rachi fusca, angulata, rugulosa, geniculatim nodosa; pedicellis tenuibus, imo articulatis, patentibus vel recurvis, calyce duplo longioribus; sepalis ovatis, obtusis, verruculosis; petalis ovatis, concavis; ovario semiinfero, distincte 2-loculari, loculis late expansis, brevissimis, multiovulatis, ovulis erectiusculis, vertice subdepresse pulvinato, radiatim striolato; stylo tereti, obtuso: pyxidio ad medium subturbinato, imo subtruncatim rotundo et sulcatim 4-lobo, supra medium zona calycari irregulariter annulata cincto; vitta interzonali angusta et acclivi; zona superiore integra; operculo orbiculari, depresse pulvinato, umbonato, infra concavo, septo signato, cum velario brevissimo descendente; pericarpio fusce suberoso et coriaceo, lenticellis flavidis sparse maculato, 2-loculari, dissepimento permanente; seminibus 10–14, subcylindricis, acute angulatis, apice truncatis, imo gradatim angustioribus, ubi hilo basali biseriatim affixis. In Amazonas: *v. s. in hb. Hook.*, Rio Negro (*Martius*); *fruct. mihi non viso.*

According to Von Martius this is a tree 100 feet high, with a straight trunk 3 to 6 feet in diameter, supported below by long projecting buttresses, growing on the banks of the river Amazonas as far as Ega, and known by the name of *Matamata*. It is said to be of lower stature when growing in open plains; but this observation is applicable, with greater probability, to either of the two following species. The axils of its branchlets are $\frac{3}{4}$–$1\frac{1}{2}$ in. apart; the leaves are 5–$7\frac{1}{2}$ in. long, 2–4 in. broad, on a petiole 3–5 lines long, and have from 12–14 pairs of nerves, with others shorter and intermediate, all anastomosing; the rachis of its several racemes is 3–$3\frac{1}{2}$ in. long, with prominent nodes 2 lines apart; the pedicels are 1 line long; sepals 2–3 lines long; petals 9 lines long, 7 lines broad; pyxidium (Plate LXI. fig. 1) is $2\frac{3}{4}$ in. long; calycary zone $1\frac{3}{4}$ in. above base, $3\frac{3}{8}$ in. in diam.; interzonal band 3 lines high; upper zone and operculum $2\frac{3}{4}$ in. in diam., latter 9 lines high, with a large terminal umbonate apex, hollow beneath; the pericarp is 2 lines thick, with a membranaceous dissepiment; the seeds are 18 lines long, 6 lines broad, 4-angular, the outer series dorsally roundish. This description of the fruit and seeds is taken from Berg (*l. c.*), and corresponds with that of the following species examined by me. Its laminated inner bark, called *Estopa*, is much used for caulking ships, but is not equal in value to that of *Bertholletia*; it fetches in the markets of Pará the price of 1$·500 per arroba, or 15*s.* per cwt. Engl.

2. JUGASTRUM OBTECTUM, nob.: *Lecythis*, sp., Spruce in Hook. Kew Journ. v. p. 239, n. 68: ramulis teretibus, substrictis, pallide brunneis, ruguloso-striatis, lenticellis verruculosis; foliis late ovatis, imo rotundate obtusis et in petiolum subito latiuscule acutatis, apice in acumen acutum breve canaliculatum recurvum subito constrictis, ad marginem tenuiter cartilagineum revolutum crenulatis vel in punctis obsoletissime serrulatis, supra subopacis, luride viridibus, in costa nervisque sulcatis, nervis tenuibus parallelis omnino immersis, venis reticulatis, subtus pallidioribus, luride brunnescentibus et glauco-pruinosis, costa nervis venisque prominulis; petiolo supra plano, subtus corruguloso, limbo 11plo breviore: inflorescentia ignota: pyxidio sub-

globoso, imo turbinato, ad medium zona calycari irregulariter lineari cincto; vitta interzonali angustissima; zona superiore integra; operculo orbiculari, conice hæmisphærico, apice breviter et obtuse umbonato, infra concavo, septo obsoleto signato, cum velario brevi intra faucem dependente; pericarpio undique ochraceo, brunneo, lenticellis flavidis maculato, tenuiter coriaceo, obsolete 2-loculari; seminibus plurimis, subcylindraceis, acute 4–5-angulatis, apice truncatis, erectis, in series 2–3 dispositis, hilo basali affixis. In Amazonas: *v. pl. s. in hb. Hook.*, Barra do Rio Negro (*Spruce*); *fruct. in Mus. Kew.* (*Spruce*, 68).

A spreading tree, 15 feet high, with a trunk 6 in. thick, called *Pao de Macáco*, growing near streams running into the river; the axils of the long weak branchlets are $1\frac{1}{4}$–$1\frac{1}{2}$ in. apart; the leaves are $4\frac{1}{4}$–$4\frac{1}{2}$ in. long, $2\frac{1}{2}$–$2\frac{7}{8}$ in. broad, on a petiole $4\frac{1}{2}$–5 lines long, and have about 12 pairs of subimmersed nerves, with others shorter and intermediate, all anastomosed. The pyxidium (Plate LXI. fig. 7) is $1\frac{3}{4}$–$2\frac{1}{4}$ in. long, $2\frac{3}{4}$ in. broad at the calycary zone, which is $\frac{3}{4}$–1 in. above the base; the interzonal band is 3 lines high; the operculum is $2\frac{1}{4}$ in. broad, and 13–15 lines high, with a velarium descending 2 lines below the mouth; the pericarp and operculum are about $1\frac{1}{2}$ line thick, both marked by the traces of the dissepiment; it contains about 16 seeds, with a thickish coriaceous testa $1\frac{1}{4}$–$1\frac{1}{2}$ in. long.

3. Jugastrum platyspermum, nob.: ramulis tenuibus, teretibus, griseo-brunneis, angulosis, verruculosis; foliis ovatis, imo obtusiusculis et in petiolum breviter acutatis, apice in acumen subobtusum recurvatum constrictis, ad marginem cartilagineum revolutum obsolete crenato-serratis, chartaceis, supra subpallide viridibus, opacis, costa paullo prominula, nervis tenuibus subimmersis, reticulatis, subtus pallidioribus, glauco-pruinosis, costa sulcata nervis venisque prominulis; petiolo canaliculato, marginato, subtus ruguloso, limbo 12–13plo breviore: inflorescentia ignota: pyxidio subgloboso, imo hemisphærico, ad medium zona calycari sublineari cincto; vitta interzonali ejusdem diametri 5–6tam partem alta; zona superiore integra; operculo orbiculari subdepresse pulvinato, apice convexo vel obsolete umbonato, infra concavo, cum velario vittæ dimidio altitudine intra faucem dependente; pericarpio subtenuiter coriaceo, ochraceo-brunneo, punctis flavidis farinosis maculato, 2-loculari, dissepimento fere evanido; seminibus plurimis, majusculis, latissime obovatis, apice truncatis, valde angulato-compressis, hilo basali biserialiter affixis. In Amazonas: *v. pl. s. in hb. Hook.*, Barra do Rio Negro (*Spruce*, 1519); *v. fruct. in Mus. Kew.* (*Spruce*, 1519), *in Mus. Brit.* (*Wallace*).

A low spreading tree, with a thick trunk, abundant in the swampy plains along the river: it is called *Máta-máta* and *Páv de Macáco*: the axils of its branchlets are $\frac{1}{2}$–$\frac{3}{4}$ in. apart; the leaves are 3–$4\frac{1}{2}$ in. long, $1\frac{5}{8}$–$2\frac{1}{4}$ in. broad, on a petiole 3–4 lines long, and with several pairs of slender semiimmersed nerves, with others shorter and intermediate, all anastomosing; the pyxidium (Plate LXI. fig. 9) is $1\frac{3}{4}$–$2\frac{1}{4}$ in. long, 2–$2\frac{5}{8}$ in. broad at the calycary zone, which is $\frac{3}{4}$–$1\frac{1}{4}$ in. above the base; the interzonary band is 4–5 lines high; the operculum, $2\frac{5}{8}$–$2\frac{3}{4}$ in. broad, is 4–6 lines high, with a velarium descending

2 lines within the mouth; the pericarp and operculum are about $1\frac{1}{2}$ line thick, both marked by the traces of the dissepiment; it contains about 16 seeds, with a coriaceous testa, about $1\frac{1}{2}$ in. long, $\frac{3}{4}$–1 in. broad, and $\frac{1}{4}$ of that thickness; the embryo presents the singular structure of the genus.

4. JUGASTRUM SUBCINCTUM, nob.: planta ignota: pyxidio depresse globoso, imo brevissime et acute turbinato, paullulo supra basin zona calycari e sepalis 6 acutis suberectis linea nexis cincto; vitta interzonali fere erecta, diametri $\frac{1}{6}$–$\frac{1}{9}$ partem alta; zona superiore circulari, integra, æquilata; operculo vitta 3–4plo altiore, convexo, obtuse umbonato, intus concavo, septi vestigio signata, cum velario intra faucem descendente; pericarpio pallide brunneo, crustaceo, granuloso-rugoso, lenticellis flavidis maculato, obsolete 2-loculari; seminibus plurimis, late oblongis, acute angulatis, apice truncatis, imo gradatim angustioribus et hilo basali biseriatim affixis. In Amazonas: *v. fr. s. in Mus. Kew.*, Rio Negro (*Spruce*).

The specimen of the fruit of this species in the Kew Museum differs from that of the preceding species in the nearly basal calycary zone. The pyxidium (Plate LXI. fig. 4) is $1\frac{5}{8}$ in. high, 2–$2\frac{1}{4}$ in. broad at the calycary zone, which is 2–3 lines above the base; the interzonal band is 3–4 lines high; the upper zone and operculum are 2–$2\frac{1}{4}$ in. in diam.; the latter 11–12 lines high, with a velarium descending 2 lines within the mouth; the pericarp and operculum are 2 lines thick; the seeds much resemble those of *J. obtectum*.

5. JUGASTRUM DEPRESSUM, nob.: planta ignota: pyxidio valde depresso, imo breviter late turbinato, sub medium zona calycari imo circulari e sepalis 6 obtusis vel acutis linea nexis cincto; vitta interzonali angusta, suberecta, diametri 8–10mam partem alta; zona superiore orbiculari, calcycarem subæquante; operculo pariter æquali, depresse pulvinato, superne fere planato aut subconcavo, centro breviter et obtuse umbonato, vittæ fere altitudine, intus plane concavo, cum velario subbrevi intra faucem descendente, obsolete 2-loculari, intus imo cicatricibus seminum 10 biseriatis notato; pericarpio subtenuiter coriaceo; seminibus angulatis, erectis, structura generis. In Amazonas: *v. s. fr. in Mus. Brit.*, Rio Negro (*Wallace*); *in Mus. Kew.* (*Spruce*).

These fruits probably belong to one of the many species of *Macacarecuya* which Dr. Spruce saw near the banks of the Rio Negro, far too high to obtain specimens, the fruits being found on the ground beneath them. The pyxidium (Plate LXI. fig. 13) is 1–$1\frac{1}{4}$ in. high, 2–$2\frac{1}{4}$ in. in diam. at the calycary zone, which is $\frac{1}{2}$ in. above the gradually contracted base; the interzonary band is 2–3 lines high; the upper zone and operculum are 2 in. in diam., the latter 3 lines high, very flattened above, and shortly umbonated in the middle, very concave within, where it is marked by the evanescent dissepiment, its velarium descending 3 lines within the mouth; the pericarp is rather thin and coriaceous, marked within along the sides with the trace of the dissepiment, and in the bottom by 10 cicatrices in 2 rows, where the seeds were attached; the seeds are like those of *J. obtectum*.

6. Jugastrum Poiteaui, nob.: *Lecythis Poiteaui*, Berg in Mart. Fl. Bras. *l. c.* p. 615: ramulis teretibus, subtenuibus, rugoso-striatis, lenticellis verruculosis, junioribus nigrescentibus; foliis oblongis, imo obtusis, apice in acumen angustum attenuatis, ad marginem tenuem revolutum obsolete serratis, subchartaceis, supra nitidis, nervis plurimis tenuissimis subpatule divaricatis semiimmersis, venis reticulatis, costa tenuissima vix prominula, subtus pallidioribus, luride fulvidis vel cinnamomeis, valde opacis, pruinosis, conspicue nigro-punctatis, costa nigra nitente prominente, nervis venisque nigris paullo prominulis; petiolo nigrescente, canaliculato, limbo 18–24plo breviore: racemo terminali folio æquilongo; rachi flexuosa, crassa, longe nodosa, transversim dense rugulosa, pauciflora; floribus majusculis; pedicellis subremotis, crassiusculis, rugulosis, recurvis; sepalis 6, oblongis, obtusis, inæqualibus; petalis 6, albo-virescentibus; androphoro albo; ovario infero, turbinato, subgranoso-rugoso, 4-loculari, ovulis in quoque loculo circ. 6, e basi erectis, vertice intra discum depresso; stylo longiusculo. In Guiana: *v. s. in hb. Mus. Brit.*, Cayenne (*Martin*); *in hb. Hook.*, Guiana Gallica (*Sagot*, 270, sub *Lecythis racemiflora*).

As Sagot's plant agrees so well with Berg's species, I have referred it to this genus on account of the structure of its androphorum and of its ovarium: it is closely allied to *Jugastrum coriaceum*. The leaves are 3–6 in. long, $1\frac{1}{2}$–$2\frac{1}{4}$ in. broad, on a petiole 2–3 lines long, and they have about 24 pairs of nerves, with others shorter and intermediate, all anastomosing; the rachis of the raceme is above 6 in. long, bare at its base for half its length, where it is $1\frac{1}{2}$–3 lines thick; the pedicels, thickened above, are smooth, recurved, nearly $\frac{1}{2}$ in. long; the flower in bud is 9 lines in diam., very broad when expanded; sepals 4 lines long, 3 lines broad; petals small when compared with the androphorum, 10 lines long, 7 lines broad; androphorum globose, 8 lines in diam. in the bud, expanded 28 lines long, 8 lines broad at the basal ring, 12 lines broad in the globose hood, which is lined with very numerous adpressed staminiferous appendages; the turbinate ovary is 4 lines long, 5 lines broad across the annular disk; the style is 2 lines long.

8. Couratari (Plate XXXV. B.).

The history of this genus is already given (*antè*, p.168), showing how its characters have been completely misunderstood and described as those of a new genus, under the name *Lecythopsis*; it only remains to offer an outline of its true generic features.

Couratari, Aubl.

Lecythopsis, Schrank, Berg: *Cariniana* (in parte), Berg (non Casar.).

Calycis adnati *sepala* 6, oblonga, obtusa, crassiuscula, subrotata. *Petala* 6, magna, oblonga, imo unguiculata, apice rotundata, concava, carnosula, subimbricata, subinæqualia, unguibus ad discum androphorumque agglutinata et cum isto decidua. *Discus* epigynus, annularis, planus. *Androphorum* majusculum, petaloideum, imo in poculum disco adnatum reductum, centro excisum, margine liberum, intus *appendiculis* numerosis brevibus subclavatis creberrimis staminigeris instructum, hinc uno latere in *ligulam* longissimam æquilatam crassam canaliculatam nudam sensim incurvatam expansum, ligula ad extremitatem reduplicatim contorta, et in nodum contracta, *galea* terminali convexa, hemisphærica, reversa, *appendiculis* numerosissimis lineari-subulatis sterilibus adpresse imbricatis extus

averse echinata. *Stamina* in appendiculis basalibus solummodo insita, iis *Lecythidis* similia. *Ovarium* omnino inferum, turbinatum, 3-loculare, vertice intra discum concavo, radiatim sulcato, margine elevato-crenato; *ovula* in quoque loculo plurima, e basi erecta, anatropa. *Stylus* subbrevis, late conicus. *Stigma* articulatim globosum, nitidum, centro cavum. *Pyxidium* subtrigone cylindricum, imo sæpe obconicum, paullo sub apicem *zona calycari* irregulariter lineari cinctum; *vitta interzonali* angusta, erecta; *zona superiore* trigono-circulari: *operculum* isti conforme, breve, supra pulvinatum, radiato-sulcatum, subconcavum, centro breviter umbonatum, subtus columella ad basin descendente auctum: *columella* solide coriacea, crassissime trigona, angulis ad parietem adnata, hoc modo loculi 3 seminigeri intermanent, et angulis demum a pariete solutis mox cum operculo seminibusque decidit: *pericarpium* exinde viduum 1-loculare apparet, tenuiter coriaceum, intus nitidum, lineis 3 cicatricatis signatum, *epicarpio* tenuiter suberoso, *mesocarpio* cancellato-fibroso. *Semina* in quoque loculo 4–6, hilo basali ad fundum columellæ affixa, erecta, imbricata, rotundatim oblonga, compressissima; *scuta* (seu *testæ* pars embryonifera) centralis, oblonga, compressa, pergaminea, *ala* lata submembranacea undique cincta: *embryo* exalbuminosus, hippocrepiformis, *radicula* æquilonga, tereti, imo paullo crassiore, ad hilum basalem spectante, apice subito recurvata, cum cotyledonibus 2 descendentibus, magnis, ovalibus, foliaceis, carnosulis, valde corrugato-plicatis, subæquilongis.

Arbores *Americæ tropicæ et Antillanæ, proceræ, frondosæ*: folia *oblonga, vel elliptica, petiolata*: racemi *terminales, pluriflori*; flores *speciosi, pedicellati*; pedicelli *bracteis* 3 *caducis muniti.*

1. Couratari Guianensis, Aubl. Pl. Gu. ii. 724, tab. 290; A. Rich. Ann. Sc. Nat. i. 329, tab. 21; Poit. Mém. Mus. xiii. 159, tab. 8. figs. 7–13; DC. Prodr. iii. 294; Berg in Mart. Fl. Br. *l. c.* p. 507; Linn. xxvii. 463: ramis patentissimis; ramulis subtenuibus, fuscis aut subcinereis, lenticellis minutis verruculosis; foliis oblongis, imo obtusis et subito breviter acutatis, apice in acumen acutum repente constrictis, ad marginem tenuem crenulato-undulatis et obsolete serratis, submembranaceis, supra brunneo-viridibus aut rufescentibus, sublucentibus, nervis plurimis divergentibus semiimmersis, venis reticulatis, costa tenui, plana, striolata, subtus pallide brunneis, opacis, nervis tenuibus fuscis vix prominulis, costa tenui, fusca, paullo prominula; petiolo fusco, profunde canaliculato, ruguloso, limbo 20plo breviore: racemo terminali, folio dimidio breviore; rachi subtenui, nodosa, 12–15-flora; pedicellis brevibus, recurvulis, cum nodis articulatis; calycis limbo campanulato, in lobos 6 acutos erectos diviso; petalis 6, inæqualibus, crassiusculis, obtuse obovatis; ovario subinfero, 3-loculari; ovulis in quoque loculo 4, e basi erectis, stylo breviter subulato, stigmate parvo globoso terminato: pyxidio cylindrico, subtrigono, imo obtuso, paullo sub apicem zona calycari lineari cincto; vitta interzonali erecta, diametri $\frac{1}{4}$ partem alta, margine tenui, paullulo reflexo; zona superiore suborbiculari; operculo alte pulvinato, radiatim sulcato, centro umbilicato et umbonato, subtus columella solida triquetra elongata aucto; pericarpio sublævi, obsoletissime multicostato, opaco, brunneo, lenticellis flavidis maculato, coriaceo-lignoso, epidermide rimosa, primum 3-loculari, post columellæ casum 1-loculari; seminibus ut in char. generico. In Guiana: *v. s. pl. sine flore in hb. Mus. Brit.*, Cayenne (*Aublet*); *v. fruct. sicc. in Mus. Brit.*

A tree of immense size, growing on the borders of rivers, with a straight trunk, 60 feet long and 4 feet in diam., affording an excellent timber; and its inner bark, composed of several scores of laminæ, is applied to many useful purposes. The axils of its

branchlets are $\frac{1}{2}$–$3\frac{1}{4}$ in. apart; the leaves are $3\frac{1}{2}$–$5\frac{1}{2}$ in. long, $1\frac{1}{2}$–$2\frac{1}{4}$ in. broad, on a petiole 2–3 lines long, and they have about 9 pairs of very fine nerves, with others shorter and intermediate, all anastomosing; rachis $3\frac{1}{2}$ in. long, with projecting nodes 4–5 lines apart; flower expanded1 $\frac{3}{4}$ in. broad; petals 8 lines long, $4\frac{1}{2}$ lines broad; the pyxidium (Plate LXII. fig. 113) is $3\frac{1}{2}$–4 in. long, $1\frac{1}{4}$ in. broad; calycary zone 4 lines below the summit; the upper zone is $1\frac{1}{8}$ in. in diam.; the operculum, of the same breadth, is 6 lines high, attached to the columella, which is 1 in. in diam., triquetrous, and the length of the cell, but contracts considerably in drying; the seeds are $2\frac{3}{8}$ in. long, 8 lin. broad, membranaceous on the margin, with an embryoniferous escutcheon 1 in. long, $\frac{3}{8}$ in. broad, the radicle terete and of that length, pointing to the basal hilum, and with corrugated cotyledons reflected downwards.

2. Couratari glabra, Camb. Fl. Br. Mer. ii. 379: *Lecythopsis glabra*, Berg in Mart. Fl. Br. *l. c.* p. 505, tab. 76: glabra, ramulis teretiusculis; foliis sparsis, oblongo-lanceolatis, utrinque gradatim angustatis, obsolete serrato-dentatis, subtus glabris, costa prominente, nervis vix prominulis, reticulatis; petiolo semitereti, canaliculato, glabro, limbo 12–16plo breviore: racemis axillaribus et terminalibus, folio brevioribus; rachi angulosa, glabra, 5–7-flora; pedicellis crassis, brevibus; sepalis late ovatis, acutiusculis; petalis subinæqualibus, obovato-rotundis, concavis, flavidis, glabris; androphoro luteo; ovario turbinato, semiinfero, 3-loculari, ovulis in quoque loculo 8, e placentis basilaribus erectis et uniserialibus, vertice elevato, complanato, glaberrimo; stylo brevi, obtuso: pyxidio subcylindrico, vix trigonoideo, zona calycari irregulariter lineari paullo sub apicem cincto; vitta interzonali angusta, paullulo convexa; operculo depresse pulvinato, radiatim sulcato, concavo, centro late et breviter umbonato, cum columella longe descendente subtriquetra agglutinato; pericarpio brunneo, opaco, subtenuiter coriaceo, primum 3-loculari; seminibus in quoque loculo 4, imbricatim e basi adscendentibus, compressissimis; scuto embryonifero ovato centrali et ala lata membranacea cincto. In Brasilia, in sylvis primævis prope Rio de Janeiro (*non vidi*).

A tree 20–30 feet high, which did not come under my observation, although growing in the woods at the foot of the Corcovado within a mile of the locality of the subsequent species. It is distinguished from that by many salient characters, especially by its complete baldness. The leaves are 2–4 in. long, 8–12 lines broad, on a petiole 2–3 lin. long; the pedicels are 2 lines long; the sepals 2 lin. long; the petals 7 lin. long, 6 lin. broad; the pyxidium (Plate LXII. fig. 5) 4 in. long; the calycary zone $2\frac{1}{2}$ in. in diam. and $3\frac{1}{2}$ in. above the base; the interzonal band $\frac{1}{2}$ in. high; the upper zone and operculum 2 in. broad, the latter 3 lines high, its columella being more than 3 in. long; the seeds, somewhat obovate, and narrower towards the base, are $1\frac{3}{4}$ in. long, $1\frac{1}{8}$ in. broad, with a central flattened escutcheon 1 in. long, $\frac{5}{8}$ in. broad, marked by a linear raphe descending to the basilar hilum.

3. Couratari rufescens, Camb. Fl. Bras. Mer. ii. 380, tab. 159: *Lecythopsis*, sp., Schrank in Act. Acad. Monac. vii. 241 (1820): *Lecythopsis rufescens*, Berg in Mart. Fl. Bras. *l. c.* p. 504, tab. 75. fig. 1: *Lecythis pyramidata*, Vell. Fl. Flum.

p. 222, Icon. v. tab. 86: ramulis validiusculis, teretibus, subflexuosis, angulato-striatis, ferrugineo-tomentosis; foliis ovato-oblongis, junioribus angustiore oblongis, imo subrotundatis vel obtusatis, apice sensim angustioribus et in acumen obtusum sæpe recurvum attenuatis, marginibus undulatis, vix recurvulis, remotiuscule et grosse crenato-dentatis, rigide chartaceis aut subcoriaceis, supra læte viridibus, valde opacis, glaberrimis, sub lente minutissime granulatis, nervis tenuibus divergentibus paullo prominulis, venis transversis creberrime elevato-reticulatis, costa tenui, subprominula, imo latiore, plana, straminea, subtus paullo pallidioribus, opacis, nervis venisque prominentibus, costa valida, latiuscula, striolata, prominente, pilis brevibus rufulis pubescente; petiolo valido, supra late sulcato, marginato, rufo-pubescente, limbo 16plo breviore: racemis axillaribus et terminalibus, folio subæquilongis, simplicibus, rarius ramosis; rachi subtenui, rufo-pubescente, 16–20-flora; pedicellis brevibus, crassiusculis, dense pubescentibus, imo articulatis et 3-bracteolatis; bracteolis oblongis, acutiusculis, deciduis, pubescentibus; sepalis 6, rotundatis, acutis, valde imbricatis, extus carinatis et dense pubescentibus; petalis 6, obovatis, unguiculatis, majusculis, flavidis, extus puberulis; androphoro majusculo, flavo; ovario turbinato, subinfero, pubescente, 3-loculari, ovulis pluribus ad axin basi affixis, erectis, vertice pulvinato, dense pilosulo, centro concavo, stylo in cavitate late umbonato, glabro, stigmate paullo minore semigloboso cavo glabro apiculato: pyxidio turbinato-cylindrico, obsolete trigono, opace brunneo, scrobiculato-ruguloso, cortice rimoso, paullo sub apicem zona calycari irregulariter lineari cincto; vitta interzonali brevi, diametri 4tam partem alta, basi erecta, apice introrsum convexa; zona superiore quam inferior paullo minore, integra, orbiculari; operculo orbiculari, depresse pulvinato, crenato-sulcato, centro concavo et umbonato, subtus columella crassa subtriquetra elongata aucto; pericarpio post operculi casum 1-loculari, tenuiter coriaceo, glabro; seminibus in loculis 3, ad columellam imo affixis, erectis, imbricatis, margine ala lata membranacea undique cinctis. In Brasilia: *v. v. in flore et in fructu*, Barro Vermelho, Rio de Janeiro.

A noble tree, with a straight trunk 40–60 feet high, with a wide-spreading head; its branchlets, $2\frac{1}{2}$ lines thick, have axils $1\frac{3}{4}$–2 lines apart; the leaves are 4–7 in. long, 2–$4\frac{3}{4}$ in. wide, on a broad petiole 2 lines long; the raceme is 2–7 in. long, the pedicels 3 lines long; the sepals 3 lines long and broad; the petals 15–17 lin. long, 9–10 lines broad; the pyxidium (Plate LXII. fig. 8) is 3 in. long, $1\frac{1}{2}$ in. broad; the interzonary band is 4 lines high, and below the mouth, which is $1\frac{1}{4}$ line broad, the operculum, of the same size, is 2 lines high, attached to the descending columella of nearly the same diameter; the seeds are much larger in proportion than in the other species, being 2 in. long and 11 lines broad, the embryoniferous disk in the centre being 14 lines long and 6 lines broad.

4. Couratari Martiana, nob.: *Lecythis Martiana*, Berg in Mart. Fl. Br. *l. c.* p. 487: glabra, ramulis teretiusculis, sulcatis, fuscis; foliis sparsis, ovali-oblongis, imo acutis, apice obtusis et breviter acuminatis, marginibus vix serrulatis, supra pallidis, nervis divaricatis, arcuatim nexis, cum aliis interjectis et anastomosantibus, venis

reticulatis, costa vix prominula; petiolo limbo 9plo breviore: racemis axillaribus et terminalibus, folio brevioribus; rachi valida, angulata; pedicellis brevibus, crassis; sepalis brevibus subrotundis, glabris; ovario 3-loculari: pyxidio majusculo, subcylindrico, aut obsolete trigono, lineis plurimis longitudinalibus obsoletissime costato, fusco-brunneo, opaco, lenticellis flavidis maculato, paullo sub apicem zona calycari cincto; vitta interzonali erecta, diametri 6tam partem alta, margine tenui extrorsum paullulo reflexa; zona superiore suborbiculari; operculo isti conformi, depresse pulvinato, radiatim sulcato, centro umbilicato et umbonato, subtus columella solida triquetra aucto; cæteris precedentium. In Brasilia, prov. Pará: *plantam non vidi*; *v. fr. s. in Mus. Brit. et Kew. et in Mus. Soc. Linn.*

This species is evidently a *Couratari*, because of its 3-locular ovary, and appears to be near *C. glabra*; the leaves are $4\frac{1}{2}$–$6\frac{1}{2}$ in. long, $1\frac{1}{2}$–$3\frac{1}{2}$ in. broad, on a petiole 6–8 lines long; the rachis of the inflorescence is 2–4 in. long; the pedicels $1\frac{1}{2}$ line long; the flower in bud is 6–8 lines in diameter. The fruit of this species (Plate LXII. fig. 1), common in collections, is most frequently mistaken for that of *C. Guianensis*; it is larger and broader, with a more depressed and broader operculum; it is 5–$5\frac{1}{2}$ in. long, $1\frac{3}{4}$–2 in. broad; the calycary zone is $1\frac{1}{2}$–$1\frac{3}{4}$ in. in diam., and 6–8 lines below the mouth; the upper zone is $1\frac{3}{4}$ in. broad; the operculum of the same diameter is 4 lines high; the seeds are $2\frac{1}{4}$ in. long, 5 lines broad.

5. Couratari coriacea, Mart., Berg in Mart. Fl. Bras. *l. c.* p. 510, tab. 75. fig. 2: planta ignota: pyxidio obconice cylindrico, manifeste subtrigono, paullo sub apicem zona calycari lineari cincto; vitta interzonali angusta, erecta, vel extrorsum subconvexa, quam diameter 6plo breviore; zona superiore subtrigona, orbiculari, margine acuto; operculo ignoto; pericarpio subtenui, coriaceo, extus lævigato, intus septorum 3 vestigiis signato; pedunculo pollicari. In Brasilia, prov. Pará (*non vidi*).

The pyxidium, of thinnish substance, is $2\frac{3}{4}$ in. long, with a calycary zone $2\frac{1}{4}$ in. above the base, and 1 in. in diam.; upper zone $1\frac{1}{8}$ broad, acute, with the interzonary band erect and slightly convex, 2 lines high.

6. Couratari Paraënsis, Mart., Berg in Mart. Fl. Br. *l. c.* p. 510, tab. 79. fig. 4: planta ignota: pyxidio cylindrice oblongo, imo urceolato, medio subinflato, paullo sub apicem zona calycari lineari cincto; vitta interzonali angustiuscula, erecta; zona superiore inferiorem æquante, orbiculari, integra; operculo ignoto; pericarpio coriaceo-lignoso, subtenui, scabridiuscule verruculoso, intus septorum 3 vestigiis signato. In Brasilia, prov. Pará (*non vidi*).

The pyxidium figured is $1\frac{3}{4}$ in. long, $1\frac{1}{8}$ in. in diam. across the middle; the calycary zone, $1\frac{1}{2}$ in. above the base, is 1 in. in diam., the upper zone of the same width, with an interzonary band $\frac{1}{4}$ in. high.

7. Couratari Tauari, Berg in Mart. Fl. Br. *l. c.* p. 509; Hook. Kew Journ. ii. 75: ramulis teretibus, striatis, fuscescentibus; foliis sparsis, late ovatis, imo obtusis et

in petiolum angustatis, apice longe acuminatis, subintegerrimis, supra fusco-viridibus, nididis, nervis utrinque 10–12 patentim incurvis adscendentibus et cum venis immersis reticulatis anastomosantibus, costa prominente ; petiolo canaliculato, limbo 12plo breviore : inflorescentia et fructu ignotis. In Brasilia, in prov. Pará, ad Tanaü, in fluv. ripis (*non vidi*).

Spruce saw this species growing at Tanaü, where it was too lofty to procure specimens of its leaves. Martius, however, obtained its leaves, though without flower or fruit, so that we are not certain that it belongs to this genus. It is a magnificent tree, with a straight trunk, strengthened at its base by strong buttresses, and affords a valuable hard timber of a palish colour, used in ship-building, yielding logs 65 feet long and 18 in. square. The name *Taüari* is also given to its laminated inner bark, consisting of many thin whitish sheets of the substance of paper, well known in commerce, being extensively used for the covering of cigarettes. The leaves are 3–5 in. long, $1\frac{1}{2}$–3 in. broad, on a petiole 3–5 lines long. Either this species or another producing an inner bark, bearing the name of *Taüari*, is found in the province of Maranhao.

8. Couratari Vriesii, nob. : planta ignota : pyxidio cylindrico imo gradatim conico, obsoletissime trigono, costulis parallelis subprominentibus circa 12 signato, intervallis tenuiter reticulatis, paullo sub apicem zona calycari e sepalis 6 parvis acutis linea nexis cincto ; vitta interzonali angusta, erecta ; zona superiore suborbiculari, margine acuta ; operculo ignoto ; pericarpio tenuissime coriaceo, brunneo, intus vestigiis septorum 3 notato. In Guiana, *v. f. s. in Mus. Kew.*, Surinam (*De Vriese*).

The pyxidium is 3 in. long, gradually attenuated downward from the calycary zone, which is $2\frac{3}{4}$ in. above the base, and $1\frac{1}{8}$ in. in diam. ; the interzonary band is 3 lines high ; the upper zone entire, acute on the edge, and $1\frac{1}{8}$ in. in diam. ; the pedicel is slender, $1\frac{1}{4}$ in. long.

9. Cariniana. (Plate XXXV. c.)

It was shown (*antè*, p. 169) that this genus of Casaretto was not accepted by botanists, and that its species were described and figured by Berg under the name of *Couratari*. It differs, however, most essentially from that genus in its smaller flowers, cup-shaped calyx, smaller, equal petals, in the structure of its androphorum, in the very thick pericarp of its fruit, and in its seeds, winged only at one extremity.

Cariniana, Casar.

Couratari, Berg (non Aubl.).

Calyx adnatus, limbo libero, brevi, cupulari, margine in lobos 6 rotundatos vel acutiores diviso, rotatus. *Petala* 6, parva, lineari-oblonga, subæqualia, apice imbricata et hic sæpius adhærentia, imo soluta, et sæpe cum androphoro modo calyptræ caduca, rarius explanata. *Androphorum* parvum, urceolato-campanulatum, ore valde obliquo, margine in appendices lineares staminiferas laciniato, cum appendicibus aliis similibus intra tubum pluriseriatis, inferioribus gradatim brevissimis, cunctis introrsum inflexis, tubo margine basali ad discum affixo. *Stamina* parva, in appendicula insita, iis *Couroupitæ* simillima. *Discus* epigynus annularis, angustissimus. *Ovarium* omnino inferum, turbinatum, 3-loculare, vertice intra discum concavo, radiatim striato, margine elevato-

crenato; *ovula* in quoque loculo plurima, e basi erecta, anatropa. *Stylus* longiusculus, tereti-subulatus, paullo incurvus. *Stigma* parvum, obsolete 3-denticulatum. *Pyxidium* cylindraceum vel pyriforme, summum versus *zona calycari* indistincte lineari cinctum; *vitta interzonali* angustissima; zona superiore circulari; *operculum* conforme, cylindricum, faucem implens, apice nullo modo prominens et plano-truncatum, vel breviter exsertum et pulvinato-convexum, subtus cum columella æquilata ad basin descendente continuum; *columella* lignosa, trigona, angulis parieti adnata, quare *loculi* 3 seminigeri intermanent; angulis demum a pariete solutis, hoc modo decidit; *pericarpium* exinde viduum, 1-loculare apparet, crassissimum, dens elignosum, intus nitidum, cicatricibus 3 linearibus et impressionibus scutorum signatum. *Semina* in quoque loculo 4–8, fundo columellæ affixa, erecta, collateraliter imbricata, elongata, apice in *scutum* embryoniferum (*testa*) subovale plano-convexum pergamineum et infra in *alam* æquilatam membranaceam, 3plo longiorem expansa: *embryo* ei *Couratari* similis, sed cotyledonibus multo brevioribus.

Arbores *Americæ intertropicæ indigenæ, procerrimæ,* trunco *amplissimo, comosæ, ramosissimæ*; folia *petiolata, elliptica vel lanceolato-oblonga, subserrulata*; panicula *terminalis, ramis expansa, multiflora*; flores *parvi, inconspicui.*

1. Cariniana excelsa, Casar. Dec. x. p. 46; Walp. Rep. v. 757: *Couratari Estrellensis,* Raddi, Mem. Soc. Ital. Modena, xviii. 403; Mem. Pl. Bras. Add. p. 25, fig. 2; D.C. Prodr. iii. 296; Berg in Mart. Fl. Bras. *l. c.* p. 511, tab. 79. fig. 5, et tab. 81: ramulis rufescentibus, teretibus, striatis, verruculosis; foliis ellipticis, imo sensim acutis, in petiolo revolutis et breviter decurrentibus, apice in acumen breve anguste obtusulum subito constrictis, crebre crenato-serrulatis, rigide chartaceis, supra pallide viridibus, opacis, costa nervisque tenuibus paullo prominulis, venis transversis reticulatis, subtus ochraceo-brunneis, opacis, nervis costaque striolata prominulis; petiolo fusco supra plano, tenuiter marginato, limbo 9plo breviore: paniculis axillaribus et terminalibus, in ramulis superioribus e foliis lapsis, in thyrsam laxe expansam dilatatis; rachi remote ramulosa; ramulis tenuissimis, compressis, ochraceo-pruinosis; floribus parvis, subapproximatis, breviter pedicellatis; calyce breviter campanulato, margine in lobos breves 6 glanduloso-ciliatos crenato; petalis oblongis, membranaceis, luteis, extus granulatim pulverulentis; ovario semiinfero, 3-loculari, vertice convexo; ovulis plurimis, biserialiter erectis, imo affixis; stylo brevissimo; stigmate minimo, 3-lobo: pyxidio elongato, ventricose cylindrico, imo acutiore, longiuscule sub apicem zona calycari inconspicuo a sepalorum vestigiis linea undulata nexis cincto; vitta interzonali suberecta et paullo inflexa, diametri dimidiam partem alta; zona superiore circulari, quam inferior tertia parte angustiore, et ad faucem acutam dentibus plurimis subremotis munita; operculo ejusdem diametri, exserto, convexo, ad columellam fere æquilatam lignosam triquetram longe descendentem arcte connato; pericarpio crasso, lignoso, denso, fusco-brunneo, obsolete ruguloso et lenticellis flavis granosis verruculoso, intus demum 1-loculari, vestigiis septorum 3 et impressionibus profunde excavatis seminum signato; seminibus in quoque loculo 6–8, biseriatim erectis, structura generis. In Brasilia, in montibus Organensibus et insula S. Sebastião (lat. 24° S.) in sylvis primævis (Raddi): *v. pl. s. in hb. Hook.*, prov. Minas Geraës ad Jaquará (*Riedel*); Brazil (*Sello*, sine loco); *v. fr. in Mus. Kew.* (sine indicio), Brazil (*Burchell*, 9077*).

This is a tree with a trunk of immense diameter, and 120 feet high, not infrequent in the province of Rio de Janeiro, affording a valuable timber, and bearing the name of *Jequitibá branca*, which is much employed in the Campos for sugar-cases. The axils of its branchlets are $\frac{3}{4}$–1 in. apart; the leaves are $1\frac{3}{4}$–$3\frac{1}{2}$ in. long, $1\frac{1}{8}$–2 in. broad, on a petiole 4–5 lines long, and they have about 12 pairs of nerves, with others intermediate, very short, all anastomosed; the panicles are 3–4 in. long, with 3 or 4 shorter branches; the pedicels 1 line long; the calyx $\frac{1}{2}$ line; the petals 2 lines long, $\frac{1}{2}$ line broad; the pyxidium (Plate LXIII. fig. 6) is $4\frac{1}{2}$ in. long (sometimes a little shorter), $1\frac{3}{4}$ in. in diam. in the middle, the calycary zone is $3\frac{3}{4}$ in. above the base, and $1\frac{1}{2}$ in. in diam.; the interzonary band is 8 lines high; the upper zone 1 in. broad; the operculum is of the same diameter, $4\frac{1}{2}$ lines high, the columella 4 in. long, 10 lines thick within the mouth for the length of 4 lines, then tapering downward, and trigonously chambered; the pericarp is $\frac{3}{8}$ in. thick; the seeds 16 lines long, 5 lines broad, membranaceous below, bearing a coriaceous embryoniferous escutcheon 5 lines long, 4 lines broad.

2. Cariniana domestica, nob.: *Couratari domestica*, Mart. Fl. Ratisb. *l. c.* p. 127; Berg in Mart. Fl. Br. *l. c.* p. 510, tab. 80: ramulis crebris, teretibus, glabris, junioribus subpuberulis; foliis ovato-oblongis, imo acute obtusis, apice in acumen subbreve obtusulum attenuatis, marginibus cartilagineis subrevolutis, leviter crenato-serrulatis, chartaceis, crebre parallele nervosis, nervis patenter divergentibus subimmersis, venis transversis, reticulatis, costa crassiuscula; petiolo canaliculato, marginato, limbo 12plo breviore: paniculis axillaribus et terminalibus, sæpe binis, folio 2–3plo longioribus, pauciramosis, bracteolis minutis donatis; ramis densifloris, angulatis, puberulis; pedicellis brevibus; calyce breviter campanulato, margine in lobos 6 rotundos expansos diviso; petalis spathulato-oblongis, obtusis; ovario infero, 3-loculari, vertice plano; stylo brevi, conico, obtuso: pyxidio urceolato-cylindrico, subcostatim hexagono, longe supra medium zona calycari annulatim prominente cincto; vitta interzonali introrsum inclinata, diametri 3tiam partem alta; zona superiore integra, quam inferior angustiore; operculo orbiculari, depresse convexo, cum columella fere æquilata continuo, hac summo breviter cylindrica, dein 3quetra, longe descendente; pericarpio crasso, dure lignoso, fusco, opaco, obsolete tuberculato; cæteris ut in præcedente. In Brasilia, prov. Goyaz, Cuyabá (*Silva Manso*): *plant. non vidi*; *v. fruct. in Mus. Kew.* (*Burchell*, 9877*).

This is a lofty tree, also bearing the name of *Jequitibá*: the axils of its branchlets are $\frac{1}{2}$–$\frac{3}{4}$ in. apart; the leaves are 3–$4\frac{1}{2}$ in. long, $1\frac{1}{4}$–$2\frac{1}{4}$ in. broad, on a petiole 3–4 lines long, and have about 24 pairs of parallel nerves; the panicle is 2–$2\frac{1}{2}$ in. long, bearing about 3 branchlets, $1\frac{1}{2}$ in. long, crowded with small flowers; the short calyx is 1 line long; the petals, verging from yellow to red, and margined with white, are 3 lines long, 1 line broad; the yellow androphorum is 2 lines long and broad, and is charged within with very numerous short staminigerous appendages. The pyxidium (Plate LXIII. fig. 4) is $2\frac{1}{2}$ in. long, the calycary zone is $1\frac{1}{4}$ in. in diam., is $1\frac{7}{8}$ in. above the base; the interzonary band is 5 lines high; the upper zone is 10 lines in diam.; the operculum, of the same breadth, is 1 line high; the columella and seeds as in the preceding species.

3. Cariniana Brasiliensis, Casar. Dec. iv. 36; Walp. Rep. v. 757: *Couratari legalis*, Mart. Fl. Ratisb. xx. Beibl. ii. 88; Berg in Mart. Fl. Bras. *l. c.* p. 512, tab. 7. fig. 151 et 163, tab. 82: ramulis brunneis, interrupte striatis, obsolete verruculoso-rugosis; foliis ellipticis vel elongato-ellipticis, imo acutis, marginibus basalibus subito breviter revolutis et in petiolo decurrentibus, apice in acumen sublineare obtusulum aut emarginatum repente constrictis, marginibus cartilagineis grossule et obtusule serratis, chartaceis, supra nitentibus vel opacioribus, profunde viridibus, nervis divergentibus tenuissimis venisque transversis reticulatis prominulis, costa tenui, subtus pallidioribus, brunnescenti- vel- glauco-opacis, costa nervis venisque prominulis; petiolo tenui, canaliculato, limbo 8plo breviore: paniculis terminalibus, folium subæquantibus, ramosis, ramis subbrevibus; rachi tenui, angulata, compressa, cum floribus subparvis subcongestis flavide pulverulenta; pedicellis brevibus; sepalis parvis, latis, subacutis, imo in tubulum breve connatis, pulverulentis; petalis lineari-oblongis, obtusis, extus flavide pulverulentis; androphoro brevi; ovario infero, turbinato, tuberculato, pruinoso, 3-loculari, vertice plano, ovulis in quoque loculo 4–6 e basi adscendentibus; stylo longiusculo, conico, imo crassiusculo, subulato, apice curvulo; stigmate minimo, cavo: pyxidio parvo, cylindrico, imo obtuso, paullo sub apicem zona calycari lineari cincto; vitta interzonali introrsum valde curvata, convexa, diametri tertiam partem alta; zona superiore quam inferior dimidio angustiore; operculo parvo, orbiculari, planatim truncato, faucem implente, cum columella ejusdem diametri continuo, hac mox triquetra et longe descendente; pericarpio lignoso, crassissimo, cortice crasso suberoso ruguloso rimoso tecto, intus post columellæ casum 1-loculari, cylindrico, impressionibus seminum excavato; seminibus in quoque loculo 4–5 imbricatim erectis, char. gen. conformibus. In Brasilia, prov. Rio de Janeiro: *v. v. in flore et fructu*, in Monte Corcovado; *v. s. in hb. Hook.* (*Martius*, 60, sine loco); (*Riedel*, 1238); (*Sello*).

This is a tree of immense size, with very broad, lofty, spreading branches, its trunk producing a timber of much value, useful in works of construction and ship-building, which is known by the name of *Jequitibá rosa*. The axils of its slender branchlets are $\frac{1}{2}$–$\frac{3}{4}$ in. apart; the leaves are $1\frac{3}{4}$–2 in. long, 9–13 lines broad, on a petiole 3–4 lines long, and with about 8 or 10 pairs of nerves arcuately conjoined near the margin, and with closely parallel transverse veins, much reticulated. In my specimens they are shining above, in others dead and opaque and a trifle smaller; the terminal panicle is $1\frac{1}{2}$ in. long, with branches 4–8 lines long, each bearing 4–6 flowers on pedicels $\frac{1}{2}$ line long; the calyx is $\frac{1}{2}$ line long; the petals $1\frac{1}{2}$ line long, $\frac{1}{2}$ line broad; the ovary is $\frac{1}{2}$ line long, its vertex $\frac{1}{2}$ line broad, the style nearly 1 line long; the pyxidium (Plate LXIII. fig. 1) is $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, 8–9 lines broad, the calycary zone being 3 lines below the summit, 8 lines in diam.; the interzonary band 3 lines high, the upper zone and operculum 3 lines in diam.: the operculum is quite flat at top, not exserted; the columella, being in the form of a solid plug, is of equal diam, 15–18 lines long, triquetrous below, with 3 flat sides, the angles arcuately conjoined 3 lines below the summit; the linear seeds are 10 lines long, 3 lines broad below, in form of a thin membrane, with an apical embryoniferous escutcheon 3–4 lines long.

4. Cariniana rubra, nob.: *Couratari rubra*, Gardn. MSS.: ramulis teretibus, subvalidis, subbrunneis, opacis, rugoso-striatis, verruculosis; foliis ovatis, imo truncato-rotundatis, a medio sursum gradatim paullo angustioribus, apice obtusis et in acumen breve obtusum recurvulum subito constrictis, marginibus cartilagineis paullo revolutis serrulato-crenatis, rigide chartaceis, supra subpallidis, opacis, nervis plurimis patenti-divergentibus parallelis tenuibus subimmersis, venis transversis reticulatis, subtus luride brunnescentibus, valde opacis, costa nervis venisque prominulis; petiolo valido, supra sulcato et marginato, rugoso-striato, limbo 10plo breviore: paniculis terminalibus, multiramosis, rachi ramisque pallide brunneis, opace pruinosis, striato-angulosis; floribus parvis, approximatis, brevissime pedicellatis; sepalis 6, acute oblongis, imo breviter connatis, lateritiis, extus carinatis, granulato-pruinosis, margine ciliatis; petalis 6, subæqualibus, obovatis, extus pruinosis, fimbriato-ciliolatis; androphoro urceolato, subbilabiato, labio antico brevissimo, postico longiore, concavo, galeatim inflexo, ad margines et intus undique appendiculis staminiferis numerosis crebre munitis; ovario infero, 3-loculari, vertice depresse pulvinato, radiatim striato; ovulis plurimis e basi erectis; stylo brevi, conico; stigmate minuto: pyxidio turbinato-cylindrico, subhexagono, angulis subcostæformibus apice arcuatim nexis, imo obtuso, longe supra medium zona calycari crasse annulata subprominente cincto; vitta interzonali introrsum convexa, diametri tertiam partem alta; operculo ignoto; pericarpio crassissimo, dure lignoso, fuscobrunneo, opaco, cortice suberoso, cancellatim rimoso, vix scrobiculato, intus vestigiis septorum 3, et impressionibus seminum signato: seminibus in quoque loculo 6, triseriatis, imbricatis. In Brasilia, prov. Goyas: *v. pl. s. in hb. Mus. Brit. et Kew., fruct. in Mus. Kew.*, ad Natividade (*Gardner*, 3473).

A large tree, with an inflorescence greatly resembling that of *C. Uahupensis*, but with very different leaves and different fruit; the latter is called *Cachimbo de Macaco* (*Monkey's pipe*). The axils of the branchlets are $\frac{3}{4}$–1 in. apart; the leaves are $4\frac{1}{4}$–$5\frac{1}{4}$ in. long, $2\frac{1}{2}$–$3\frac{1}{4}$ in. broad, on a petiole 5–6 lines long, and have about 16 to 18 pairs of nerves arcuately conjoined near the margin; the terminal panicle is 6 in. long, with lateral branches $1\frac{1}{2}$–$2\frac{1}{2}$ in. long; pedicels $\frac{1}{2}$ line apart and $\frac{1}{2}$ line long; the flowers are of a brick-red colour, with a yellow androphorum; the calyx expanded is 2 lines across, its segments $\frac{1}{2}$ line long and broad; petals 3 lines long, 2 lines broad, narrowing towards the base; the androphorum $1\frac{1}{2}$ line long and broad; the pyxidium (Plate LXIII. fig. 10) somewhat like that of *C. domestica*, but broader and stouter; it is 3 in. long (sometimes 4 in.), $1\frac{1}{2}$ in. broad; the calycary zone, $2\frac{1}{4}$ in. above the base, is nearly $1\frac{3}{4}$ in. in diam. and 3 lines thick; the interzonary band is 6 lines high; the upper zone 9 lines in diam.; the pericarp is 5 lines in thickness.

5. Cariniana uahupensis, nob.: *Couratari Uaupensis*, Berg in Mart. Fl. Bras. *l. c.* p. 508, tab. 78: *Amphoricarpus Uaupensis*, Spruce MS.: ramulis cortice crassiusculo rimoso tectis, cinereo-opacis, tortuose striatis, pruinosis; foliis magnis, oblongis, imo sensim obtusis, et in petiolum breviter acutatis, apicem versus rotundatis et in acumen longiusculum angustissimum mucronatum subito attenuatis, subintegris,

marginibus cartilagineis valde revolutis et undulatis, subcoriaceis, supra pallide aut profundius viridibus, nitidiusculis, nervis plurimis parallelis recte divergentibus paullo prominulis, venis tenuissimis creberrime transversis reticulatis, costa fusca semiimmersa, subtus ochraceo-pallidis, valde opacis, costa nervisque rufescentibus valde prominentibus; petiolo valido, profunde canaliculato, marginato, subtus corrugulato, limbo 14plo breviore: paniculis axillaribus, ultimis e foliis delapsis thyrsam folio breviorem simulantibus, laxe expansis, remotiuscule alternatim ramosis, ramis iterum longiuscule ramulosis, ramulis rectis, angulato-striatis, subflexuosis, crebre multifloris; floribus parvis, sessilibus, eburneis (siccis fuscis); calyce patellæformi, margine expanso, in lobos 5 brevissimos rotundatos diviso; petalis 5, lineari-oblongis, carnosulis, rarius expansis, sæpius apicibus imbricatis agglutinatis et in forma calyptræ caducis; androphoro urceolato-tubulari, sub-2-labiato, labio antico breviore fere ad basin in appendiculas 4 subulatas diviso, postico 2plo longiore, margine in appendices 6 laciniato, appendiculis cunctis cum aliis brevioribus tubo 2-seriatim ortis staminiferis; ovario infero, 3-loculari, vertice plano; ovulis plurimis e basi erectis; stylo calyce 2plo longiore, subulato, subincurvo; pyxidio cylindraceo, imo rotundato, paullo sub apicem zona calycari indistincte lineari cincto; vitta interzonali prominente, annulari, convexo, diametri 8vam partem alta; zona superiore inferiorem æquante; operculo ignoto; pericarpio crassissimo, lignoso, cortice crassiusculo suberoso longitudinaliter valde rimoso tecto, opace brunneo, lenticellis flavidis crebre maculato, intus demum 1-loculari, vestigiis septorum 3 et impressionibus seminum signato. In Brasilia: *v. pl. s. in hb. variis, cum fruct. in hb. Hook.*, prope S. Carlos, Rio Uahupes (fluv. Nigri tribut.) in ripis (*Spruce*, 2510).

A tree of vast size, with a trunk 100 feet high, five feet in diam., strengthened at its base by projecting buttresses, and called *Chorão* and *Choro* by the natives, signifying magnificent: I have amended Spruce's specific name to its more correct spelling. The axils of its branchlets are 1 in. apart; the leaves are $9\frac{1}{2}$–11 in. long, $3\frac{3}{4}$-5 in. broad, on a thick petiole 8–9 lines long; they have 22–27 pairs of nearly straight parallel nerves, archingly united close within the margin, with very close transverse parallel veins; the panicle is 5–$7\frac{1}{2}$ in. long, 3–6 in. broad; the branches 3–4 in. long, the branchlets 1 in. long, 3 lines apart, with sessile flowers $\frac{1}{2}$–1 line apart, 3 lines long, 2 lines in. diam. in the bud; the calyx expanded is 2 lines across; the petals are 3 lines long, 1 line broad; the androphorum $2\frac{1}{2}$ lines long. Besides the 10 external appendages, there are 20 others, very short and in 2 series, inserted on the tube, one series basal, all staminiferous at the incurved apex; the filament is very short and slender, bearing a small oval anther of 2 parallel cells bursting longitudinally; the pyxidium (Plate LXIII. fig. 9) is $3\frac{3}{4}$ in. long without the operculum, and $1\frac{3}{4}$ in. in diam.; the calycary zone is 3 lines high, 2 in. in diam.; the upper zone $1\frac{3}{4}$ in. in diam.; the pericarp is 3 lines in thickness.

6. Cariniana exigua, nob.: ramulis teretibus, substrictis, rufo-brunneis, pruinosis, verruculosis; foliis lanceolatis vel elongato-oblongis, imo obtusis et subito versus petiolum brevissime constrictis, a medio sursum gradatim attenuatis, acutiuscule

acuminatis, margine tenui pallido crenato-serrulatis, chartaceis, supra profunde viridibus, sublucentibus, sub lente minute granulatis, nervis plurimis tenuissimis patenti-divergentibus semiimmersis, venis transversis reticulatis, costa vix prominula, pruinosa, subtus pallide brunneis, opacis, costa striolata, prominula, subpuberula, nervis prominulis, in axillis subbarbatis; petiolo tenui marginatim canaliculato, limbo 30plo breviore: paniculis 1 vel 2, axillaribus et terminalibus, vel in ramulis supremis e foliis delapsis in thyrsam latam expansis, axillaribus, folio paullo longioribus, rachi verruculosa; ramulis paucis, patentibus, tenuissimis, puberulis; floribus minimis, subapproximatis, tenuiter pedicellatis; sepalis 6, imo in cupulam brevissimam connatis, oblongis, membranaceis, subviridulis, puberulis, ciliatis; petalis 3–4plo longioribus, lineari-oblongis, expansis; androphoro imo breviter cupuliformi, ligula late ovata, erectiuscula, intus undique et in marginibus appendiculis staminiferis crebre vestito, antheris didymo-globosis; ovario semiinfero, 3-loculari, vertice alte conico, lævi, ovulis paucis, e basi biserialiter erectis; stylo tenui, brevi; stigmate minimo, obtuso. In Antillis: *v. pl. s. in hb. Hook.*, in insula Trinidad, in hort. bot. cult. (*Prestoe*).

A tree 60 feet high, apparently first discovered by Purdie, and now cultivated in the Botanic Garden of Trinidad. The axils of its slender branchlets are $\frac{1}{2}$ in. apart; the leaves are 3 in. long, 1 in. broad, on a petiole $1\frac{1}{2}$ line long, and they have about 20 pairs of parallel nerves, with very fine parallelly transverse reticulated veins, with the axils of the nerves barbated beneath: the branches of the compound panicle are 3 in. long, with branchlets very slender, $\frac{3}{4}$–1 in. long, bearing flowers on short pedicels, 2 lines apart; the flower expanded is 7 lines broad; the sepals are 1 line long; the petals 3 lines long, 1 line broad; the ligula of the androphorum is 1 line long and broad; the semiinferior ovary is $\frac{1}{2}$ line in diam.

7. CARINIANA PYRIFORMIS, nob.: planta ignota: pyxidio pyriformi, urceolato-cylindrico, ab imo obtuso sursum sensim ampliore, longiuscule supra medium zona calycari lineata cincto; vitta interzonali acclivi, convexa, diametri 3tiam partem alta; zona superiore quam inferior fere dimidio minore; operculo omnino applanato, nullo modo exserto, imo cum columella exacte obconica solidissima infra apicem triquetra longe descendente continuo; pericarpio crassissimo, solidissimo, brunneo, opaco, subruguloso, post columellæ casum 1-loculari, intus exacte obconico, vestigiis septorum 3 sub apicem arcuatim nexis et impressionibus seminum signato; seminibus in quoque loculo 6–7, biseriatim imbricatis, erectis, imo affixis, structura generis. In Bolivia: *v. fr. s. in Mus. Soc. Linn.*, Betania, Rio Sinu, Bolivia (*Anthoine*); *in Mus. Kew.*, exempla 3 (sine loco).

The label attached to the Linn. Soc. specimen, in Anthoine's handwriting, says "Betania rivière sinu Plato Bolivia, New Granada," which I interpret to mean some small river Betanie flowing into the Magdalena near Plato. The pyxidium (Plate LXIII. fig. 11) is $3\frac{1}{2}$ in. long, $2\frac{1}{8}$ in. in diam. on the calycary zone, which is $2\frac{1}{2}$ in. above the base; the interzonal band is 10 lines high; the upper zone and operculum are $1\frac{3}{4}$ in.

broad, the latter, descending to a length of 3 in., is plug-shaped, as in *C. Brasiliensis*, but larger and more obconical, it is triquetral, the angles archingly united ½ in. below the summit; the seeds are 17 lines long, 3 lines broad, membranaceously winged below, with an apical embryoniferous escutcheon, obliquely oblong, 5 lines long and 3 lines broad.

10. Allantoma (Plate XXXVI. A).

The very peculiar structure of the androphrorum and of the seeds readily distinguish this genus from *Couratari*, its peculiarities having been already noted (antè, p. 170).

Allantoma, nob.

Lecythis (in parte), Smith, Berg: *Couratari* (in parte), Berg.

Calycis adnati *sepala* 6, parva, rotundata, subimbricata, rotata: *petala* 6, inæqualia, quorum 2 exteriora multo majora, altera in æstivatione omnino tegentia, oblonga, concava, unguiculata, 4 interiora minora, lineari-oblonga. *Discus* epigynus, annularis, planus. *Androphorum* petaloideum, succoso-carnosum, imo in poculo parvo disco adnato centro exciso signatum, intus appendiculis numerosissimis brevibus subclavatis staminigeris creberrime instructum, hinc uno latere, in *ligulam* longam æquilatam crassam canaliculatam nudam sensim incurvatam expansum, extremitate reduplicatim in nodum crassum contorto; *galea* convexa, hemisphærica, reversa, et subito sursum retroflexa, margine fimbriata, intus appendicibus sterilibus in massam carnosulam arcte agglutinatis. *Stamina* in appendicibus basalibus solummodo insita, iis *Couratari* similia. *Ovarium* omnino inferum, turbinatum, 4–5- rarius 3-loculare, vertice intra discum subconcavo; *ovula* in quoque loculo 4–6, collateraliter 2–3-serialia, imo affixa, erecta. *Stylus* brevis, crasse teres. *Stigma* parvum, fungiforme. *Pyxidium* cylindricum, ei *Couratari* simile, paullo sub apicem *zona calycari* lineari cinctum; *vitta interzonali* angusta, erecta, plana vel convexa; *zona superiore* circulari: *operculum* conforme, breve, depresso-pulvinatum centro breviter umbonatum, subtus ad columellam longe descendentem agglutinatum: *columella* solida, crassissima, 3–5-gona, angulis parieti adnatis, quare loculi 3–5 intermanent, angulis demum a pariete solutis, hæc cum seminibus decidit: *pericarpium* exinde viduum 1-loculare apparet, crassiuscule sublignosum, intus nitidum, cicatricibus signatum, extus cortice crasso rimoso vestitum, vel ecorticatum. *Semina* in quoque loculo 4–6, lineari-oblonga, plano-convexiuscula, ad faciem exteriorem marginesque corrugulata, imo 2-auriculata, erecta, imbricata, *hilo* parvo ad dorsum auriculæ alterius ad columellam affixa: *testa* subcoriacea, vasis spiralibus innumerabilibus repleta: *integumentum internum* tenuissimum: *embryo* exalbuminosus, lineari-cylindricus, fusiformis, subcompressus, albido-opacus, maceratione mollissimus, homogeneus, *neorhiza* centrali, elongata, tereti, in *exorhiza* carnosa externa sepulta. *Germinatio* ignota.

Arbores, *plerumque vastæ, Americæ intertropicæ, ramosissimæ:* folia *petiolata, in summo ramulorum subapproximata, ovata, vel oblonga.* Flores *in paniculis terminalibus subparvi, succo purpureo sæpius repleti.*

1. Allantoma multiflora, nob.: *Lecythis multiflora*, Smith in Rees's Cycl. xx. n. 8; DC. Prodr. iii. 293; Berg in Linn. xxvii. 460: ramulis valde rugosis, angulato-striatis, lenticellis pallidis crebre verruculosis, junioribus tenuioribus, brunneis, ferrugineo-opacis vel pulverulentis, lenticellatis; foliis ovatis, imo rotundato-obtusis, et in petiolum breviter acutatis, apice in acumen obtusulum attenuatis, marginibus subrevolutis obsolete crenato-serratis, rigide chartaceis, supra luride viridibus, subopacis, nervis curvatim divergentibus, subprominulis, venis reticulatis, subtus paullo pallidioribus, opacis, nervis venis costaque striolata prominentibus; petiolo

subtenui, marginatim canaliculato, limbo 12plo breviore: racemis axillaribus et terminalibus, folio brevioribus; rachi rugosa, compresse striata, ferrugineo-opaca, subpuberula, lenticellata, spicatim multiflora; pedicellis longissimis tenuibus, recurvatis, striolatis, imo articulatis; sepalis parvis, ovatis, subacutis, patulis, margine membranaceo-ciliatis; petalis rotundatis, subinæqualibus; androphoro carnoso, granulatim ruguloso, structura generis; ovario infero, semiovali, subgranulato, puberulo, 3-loculari, ovulis plurimis basi affixis, erectis, vertice plano, radiatim granulato; stylo brevi conico. In Guiana: *v. s. in hb. Hook.* (*Parker*, cum foliis et floribus); *in hb. Mus. Brit. et Soc. Linn.*, Cayenne (*Martin*, foliis diremptis).

Parker's specimen enables us to recognize those of Martin, where all the leaves are wanting, and upon which Sir James Smith first established the species, which has since been doubtfully acknowledged. The axils of its slender branchlets are $\frac{3}{4}$–1 in. apart; the leaves, generally caducous, are $3\frac{3}{4}$–4 in. long, $1\frac{5}{8}$–$1\frac{7}{8}$ in. broad, on a petiole 3–4 lines long, and with about 12 pairs of parallelly divergent arching nerves, with others shorter and intermediate, all anastomosed; the panicle is 5 in. long, has several slender branches, with approximated prominent nodes 2–3 lines apart, each bearing a very slender pedicel $\frac{3}{4}$–1 in. long; the flower, before expansion, is $\frac{1}{2}$ in. in diam.; the sepals are $1\frac{1}{4}$ line long; the development of the androphorum closely resembles that figured in Plate XXXVI. A; its semioval head is 2 lines long and broad.

2. Allantoma subramosa, nob.: ramulis subcinereo-opacis, rugoso-striatis, subverruculosis, junioribus lævibus et striatis; foliis ovatis, vel ovali-oblongis, imo rotundatis aut rotundo-obtusis, sæpe circa petiolum breviter acutatis, marginibus undulatis fere integris, obsoletissime serrulatis, subcoriaceis, supra pallidis, opacis, nervis plurimis semiimmersis, crebre parallelim divergentibus, rectiusculis, circa marginem nexis, venis transversim reticulatis immersis, costa sulcata, subtus ochraceo-opacis et granulato-pruinosis, aut fuscioribus, nervis venisque transversis prominentibus; petiolo profunde canaliculato, marginibus submembranaceis introflexis, limbo 5–8plo breviore: panicula terminali, valde ramosa; rachi cinerea, rugulosa; ramis fuscis, approximatis, tenuioribus, valde nodosis, plurifloris; pedicellis teretibus, gracilibus; floribus subparvis, roseo-purpureis; sepalis parvis, rotundatis, subimbricatis, fuscis, extus pruinosis; petalis 6, quorum 4 interioribus, lineari-oblongis, subinæqualibus, membranaceis, 2 exterioribus majoribus suborbiculatis, valde membranaceis, extus farinoso-pruinosis; ovario infero, hemisphærico, 3-loculari, ovulis plurimis basi affixis, erectis, vertice concavo, radiatim striolato; stylo pulvinato; stigmate rotundato: fructu ignoto. In Guiana Batava: *v. s. in hb. Mus. Brit. et Hook.*, ad Karavoury (*Sagot*, 271, sub *Couratari Guianensis*).

This plant is very different from Aublet's *Couratari Guianensis* in the shape, texture, and venation of its leaves. Notwithstanding its 3-celled ovary, I have placed it in the genus *Allantoma*, on account of its ramosely paniculate inflorescence, its long slender pedicels, and more especially because of the peculiar development of its androphorum. From its smallish flowers, upon the long slender pedicels of a very branching panicle,

from its hemispherical 3-celled ovary, and the peculiar structure of the androphorum, it is unquestionably congeneric with the other species here enumerated.

The axils of its rugose branchlets are about 3 lines apart; the leaves are $4\frac{1}{2}$–$6\frac{1}{2}$ in. long, $2\frac{1}{2}$–$2\frac{3}{4}$ in. broad, on a petiole 8–10 lines long; and they have about 24 pairs of straight parallel nerves, united near the margin by an arching line; the terminal panicle is $2\frac{1}{2}$–$3\frac{1}{2}$ in. long, with many irregular branches, each 1–3 inches long, all rough and with articulated prominent nodes 1 line apart; the pedicels are 7–9 lines long; the sepals 1 line long and broad; inner pair of petals 7 lines long, $2\frac{1}{2}$ lin. broad, 2 intermediate 9 lin. long, 3 lin. broad, 2 exterior 12 lines long, 10 lin. broad, tapering towards the base, all membranaceous and of a roseate pinkish colour; the androphorum, of a deep red or purple colour, consists of a shallow cup-shaped ring, attached to the disk and charged with very numerous short staminiferous appendages; and this is expanded on one side into a long fleshy canaliculated ligula, coiling round inwards, and terminating suddenly in a fleshy knob, where it is as suddenly recurved in the same direction, finally expanding into a galeated hood, convex outside, concave within, and simply fimbriated or toothed on its margin, all coiled into a globular head, 3 lines in diameter. This structure agrees with that of the preceding species.

3. Allantoma torulosa, nob.: arbor alta; ramulis crassis, angulosis, in axillis crebris transversim annulatis; foliis oblongis, imo acutis, apicem versus breviter et obtuse acuminatis, marginibus leviter serrato-crenatis, tenuiter chartaceis, supra brunneo-viridibus, opacis, costa planata, nervis plurimis crebriter parallelis, erecto-patulis, subimmersis, subtus vix pallidioribus, costa fusca convexa, nervis pallide brunneis prominentibus, venis creberrime et transversim parallelis: pyxidio in ramis sessili, cylindrico, imo rotundato, zona calycari paullo sub apicem vix manifesto; vitta interzonali convexe erecta, diametri 4tam partem alta; zona superiore circulari, fauce erecta acuta; operculo conformi, vittæ altitudine, pulvinatim convexo, medio obtuse umbonato, subtus columella crassissima ad basin descendente aucto; columella solida, acute 5-gona, angulis ad parietem adnatis; pericarpio primum 5-loculari, casu columellæ deinde 1-loculari, intus nitido, lineis 5 longitudinalibus cicatricatis notata, extus toroso-tuberculato, ochraceo-brunneo, opaco et minute granulato; seminibus 20, ut in char. gener. In prov. Pará: *v. s. folium et fructus in Mus. Brit.*, in sylvis ad Culantigo, Rio Maranhão (*Farries*, 69); *in Mus. Kew.*, sine operculo (*Farries*).

Accompanying the specimen in the British Museum there is only a single leaf, much resembling that of the preceding species: it is 7 in. long, $2\frac{1}{2}$ in. broad, with about 20 pairs of parallel ascending nerves running up close to the margin; the petiole is wanting; the fruit is sessile upon an annulated branchlet $\frac{3}{8}$–$\frac{1}{2}$ in. thick, with transverse axils 3 lines apart; the pyxidium (Plate LXIV. fig. 1) is $7\frac{1}{4}$ in. long, $2\frac{1}{2}$ in. broad; the calycary zone is 6 in. above the base; the interzonal band is 7 lines high; the upper zone with an acute edge, and the fitting of the operculum, are $2\frac{1}{2}$ in. in diam., the latter being $\frac{1}{2}$ in. high; the pericarp is coriaceous, 3 lines thick; the hard dark-coloured seeds are 2 in. long, 4 lines broad, and 2 lines thick. Mr. Farries states, in a memorandum, that the

fruit is called "*Monkey-pot*," that when ripe it discharges the lid and seeds, the vacant shell hanging upon the branches. He found it "in woods in Culantingo, Maranhão river" (is not this Curuatingo, a river flowing from the south side into the Amazonas 9 leagues to the east of Santarem?): this pronounced by blacks (who always transmute *r* into *l*, shortening the syllable) would be Culantingo.

4. Allantoma cylindrica, nob.: planta ignota: racemi fructiferi rachi subtenui, angulato-striata, subtereti, ochraceo-opaca, crebre nodulosa: pyxidio cylindrico, imo rotundato, longe supra medium zona calycari e sepalorum vestigiis linea nexis subprominente cincto; vitta interzonali erecta, margine tenui, subreflexo, cujus diametri 7mam partem alta; operculo orbiculari, pulvinato, radiatim striato, vertice concavato, cum umbone brevi obtusulo in cavitate, subtus columella crassa 4-angulata longe descendente aucto; pericarpio brunneo-opaco, lenticellis flavidis crebre punctato, crassiuscule coriaceo, intus leviter cylindraceo, vestigiis septorum 4 arcuatim nexorum signato; seminibus grate edulibus, in quoque loculo 4, lineari-elongatis, compressis, valde corrugulatis, apice truncatis, imo breviter 2-auriculatis, 2-serialiter ad columellam hilo fere basali erectim affixis. In Amazonas: *v. fr. s. in Mus. Kew.*, in insula prope Cametá, prov, Pará (*Farries*).

The pyxidium (Plate LXIV. fig. 4) is 5 in. long, regularly cylindrical, and $1\frac{3}{4}$ in. in diam.; the calycary zone, of the same diameter, is $4\frac{1}{2}$ in. above the base; the interzonal band is $\frac{1}{2}$ in. high; the operculum is $1\frac{3}{4}$ in. in diam., 3 lines thick, the columella shrinking much in drying; the pericarp is nearly 3 lines in thickness, is quite smooth, and cylindrical inside, marked by 4 longitudinal lines, where the angles of the columella have become detached, and which are arcuately conjoined near the summit, 6 lines below the mouth; the seeds are $1\frac{1}{2}$ in. long, 3 lines broad, 1 line thick, with a structure explained in the generic character (p. 291). The fruit only of this species was found by Mr. Farries, on one of the islands near the town of Cametá, which is situated on the south bank of the Amazonas, near its confluence with the river Tocantins, about 45 miles south of the City of Pará. It differs from that of the preceding species in its smaller size, in being regularly cylindrical in form, with a smoother surface, a thinner pericarp, which is 4- (not 5-)celled. It differs from *A. Burchelliana* in its more cylindrical shape, a much thinner and ecorticated pericarp, a vertical smooth interzonal band. Mr. Farries states, on the ticket attached to it, "that its flat seeds are good eating, yielding a crop once a year; the fruit is called by the natives *Castanheira da serra*, and by the English *skittle-nut*, because it is like a skittle."

5. Allantoma Burchelliana, nob.: ramulis teretibus; foliis oblongis, imo rotundatis, sursum gradatim angustioribus, apice in acumen longiusculum acutum attenuatis, subintegris, vel in margine cartilagineo subrevoluto obsolete crenulatis, firme chartaceis, supra subnitidulis, vel sub lente granulato-opacis, apud nervos tenues paullo prominulos sulcatis, nervis plurimis crebriter parallelis, patentim divaricatis, fere rectis, eveniis, costa tenui, plana, subimmersa, subtus subnitentibus, badiis,

costa striolata nervisque prominentibus et rubescentibus, venis tenuissimis paullo prominulis crebre transversim reticulatis, petiolo latiusculo, supra plano, limbo 40plo breviore: racemo terminali, folio fere æquilongo; rachi subflexuosa, nodosa; floribus sessilibus; ovario infero, subgloboso, granulose rugoso, opaco, 4-loculari, ovulis plurimis, e placentis basalibus erectis, vertice plano, pruinoso, stylo brevissimo umbonato: pyxidio cylindrico, imo rotundato paullo ampliore, sub apicem zona calycari irregulariter lineari cincto; vitta interzonali annulatim prominente, convexa, quam diametri quartam partem alta; zona superiore integra, orbiculari, inferiorem æquante; pericarpio crasso, coriaceo-lignoso, cortice crasse suberoso, rimoso, sublævi, opace cinnamomeo, glandulis flavidis maculato, intus septorum 4 vestigiis signato; seminibus lineari-oblongis, compressis, apice truncatis, imo 2-auriculatis, toruloso-rugulosis, rufescenti-opacis, erectis, cum embryone generis. In Brasilia, regione Amazonica: *v. pl. s. in hb. Hook., et fruct. in Mus. Kew.* (*Burchell*, 9314).

In habit this plant greatly resembles the three first-mentioned species, agreeing in the peculiar vernation of the leaves; these are 6–7 in. long, 2–2$\frac{7}{8}$ in. broad, on a petiole 3 lines long, and have a semimetallic bronzy hue, with about 24 pairs of approximate nerves, running straight towards the margin, close within which they are simply conjoined. The rachis of the raceme is about 5 in. long, with prominent nodes, about 3 lines apart. The pyxidium (Plate LXV. fig. 6) is 5$\frac{3}{4}$ in. long without the operculum, 2–2$\frac{1}{4}$ in. in diam. above the base, narrowing gradually to the calycary zone, where it is 2 in. in diam.; the interzonal band is 2$\frac{1}{4}$ in. in diam. in its middle, is $\frac{1}{2}$ in. high, and 1$\frac{3}{4}$ in. in diam. at the upper zone; the pericarp is 2$\frac{1}{2}$ lines in thickness, showing inside the cicatrices of 4 dissepiments. It resembles that of *A. torulosa* in shape, especially in its prominent tumid interzonary band, but it is broader towards the base, and more truncated, and is covered with a much thicker, more widely cracking, yellowish red bark, with many raised yellow granules. The seeds, like those of the preceding species, but thicker and of a dark-red colour, are 13 lines long, 4 lines broad, and 3 lines thick.

6. Allantoma macrocarpa, nob.: *Couratari macrocarpa*, Mart.; Berg in Mart. Fl. Br. *l. c.* p. 509. tab. 79. fig. 1.: planta ignota: pyxidio cylindrico, imo rotundato paullo ampliore, sursum gradatim angustiore, paullo sub apicem zona calycari lineari cincto; vitta interzonali erecta, diametri 5tam partem alta, apice breviter extrorsum inflexa; zona superiore integra, circulari; operculo æquilato, depresse pulvinato, vertice convexo et obtuse umbonato, vel concavato et radiatim striato, cum umbone brevi in centro; columella adnata, longe descendente, solida, 4–5-gona, angulis parieti adnatis; pericarpio hinc 4–5-loculari, denique 1-loculari, crassiusculo, sublignoso, fusco-brunneo, extus cortice suberoso, valde rimoso, intus cylindraceo et septorum vestigiis 4–5 cum impressionibus seminum 4 in quoque loculo signato. In Brasilia, in prov. Pará, legit Mart: *v. fr. s. in Mus. Kew.* (sine indicat.).

An immense tree, too lofty to obtain specimens of its leaves or flowers. The pyxidium (Plate LXIV. fig. 9) is 5$\frac{1}{4}$ in. long, 2$\frac{1}{2}$ in. in diameter near the base, diminishing upwards to a breadth of 1$\frac{3}{4}$ in. at the calycary zone, which is 4$\frac{3}{4}$ in. above the base; the

interzonary band is 4 lines high; the upper zone is 2 in. in diam., has a sharp lip turning outwards; the operculum, a trifle wider, is $2\frac{1}{8}$ in. in diam., and 3 lines high. Martius, as well as Burchell, collected the fruits lying on the ground, but did not find the seeds.

7. Allantoma scutellata, nob.: planta ignota: racemis fructiferis axillaribus, longiusculis, angulatis; rachi crebre nodosa, multiflora; floribus sessilibus: pyxidio obconice cylindrico, ochraceo-brunneo, valde opaco, imo sensim obtuso, paullo sub apicem zona calycari subacute lineari prominula cincto; vitta interzonali acclive convexa, diametri 7tam partem alta; zona superiore circulari, calycari angustiore; operculo tenuiuscule scutelliformi, depressissime pulvinato, vertice concavo, medio breviter umbonato; columella ei infra adnata, fere ad basin descendente, solide crassa, faucem implente, subtus 4-angulata, 4-sulcata, angulis ad parietem agglutinatis et hoc modo loculos 4 efficientibus; angulis demum solutis hæc cum seminibus decidit; pericarpio subtenuiter coriaceo; seminibus paucis, lineari-oblongis, compressis, imo 2-auriculatis, undique grossule rugosis, fuscis, erectis, cum hilo subventrali et basalari. In Brasilia: *v. s. fruct. in Mus. Soc. Linn.* (sine loco), Capt. Sir E. Home; *in collect. Mus. Brit.* (sine indicat.).

There can be no doubt that this fruit belongs to *Allantoma*. The rachis of its many-flowering raceme is about 6 in. long, with alternate prominent cicatrices 1–2 lines apart; the pyxidium (Plate LXV. fig. 1) is $3\frac{3}{8}$–$3\frac{3}{4}$ in. long, $1\frac{1}{2}$–2 in. in diam. below the calycary zone, and tapering downwards; the calycary zone, 3 in. above the base, is $1\frac{3}{4}$–$2\frac{1}{8}$ in. in diam.; the interzonal band is 3–4 lines high, very convex, narrowing above; the upper zone is $1\frac{1}{4}$–$1\frac{5}{8}$ in. in diam.; the operculum is orbicular, of the same diameter, is $1\frac{1}{2}$ line high, with a rounded edge, umbonate in its concave vertex, is attached to a central columella 2 in. long, filling the mouth of the pericarp, descending to the base, sharply 4-angled, with 4 broad hollowish intervals, which form the cells; pericarp $1\frac{1}{2}$ line thick, cylindrical within; seeds, by abortion, only 4 in the specimen examined, 19 lines long, 4 lines broad, 1 line thick, fuscous, attached to the base of the columella at the inner face, by a small hilum upon one of its basal auricles. There is a little difference in the somewhat broader shape and narrower interzonal band in the British-Museum specimen, which wants the operculum and seeds.

8. Allantoma aulacocarpa, nob.: *Couratari aulacocarpa*, Mart., Berg in Mart. Fl. Br. *l. c.* p. 509, tab. 79. fig. 2: planta incognita: pyxidio late cylindrico, imo rotundato, longe supra medium zona calycari lineatim prominula cincto; vitta interzonali erecta, apice paullulo convexa, diametri 6tam partem alta; zona superiore integra circulari; operculo ignoto; pericarpio coriaceo-lignoso, crasso, cortices pisso-suberoso valde rimoso et secedente tecto, intus demum 1-loculari, cylindrico, vestigiis septorum 4, et impressionibus plurimis seminum signato. In Brasilia, prov. Pará, legit *Martius* (*non vidi*).

This fruit (Plate LXV. fig. 9) differs from that of *A. macrocarpa* in its erect interzonal band, turned inwards at the summit (not outwardly), and in its thicker bark; it is

$4\frac{1}{8}$ in. long, $2\frac{1}{8}$ in. in diam.; the calycary zone, of similar diameter, is $3\frac{3}{8}$ in. above the base; the interzonal band is 4 lines high; the pericarp is 3 lines thick.

9. Allantoma dictyocarpa, nob.: *Couratari dictyocarpa*, Mart., Berg in Mart. Fl. Br. *l. c.* p. 510, tab. 79. fig. 3: planta ignota: pyxidio subovali, subcylindrico, imo rotundato-obtuso, medio subventricoso, paullo sub apicem zona calycari lineari cincto; vitta interzonali diametri 8vam partem alta, erecta; zona superiore inferiori æquilata, integra; operculo orbiculari, pulvinatim paullo latiore, depresso, supra plano, medio obtuse umbonato; pericarpio crassiusculo, extus lævigato, cortice resiliente, mesocarpio fibris lignosis reticulatis signato, primum 4-loculari. In Brasilia, prov. Pará (*non vidi*).

This species is placed in *Allantoma* on account of 4-celled fruit; the pyxidium (Plate LXIV. fig. 10) is $2\frac{3}{4}$ in. long, $1\frac{1}{2}$ in. in diam. in the middle, contracted to $1\frac{1}{4}$ in. at the calycary zone, which is $2\frac{1}{4}$ in. above the base; interzonary band 3 lines high; upper zone $1\frac{1}{4}$ in. in diam.; operculum somewhat overhanging, $1\frac{1}{2}$ in. in diam., 3 lines thick, with an umbonate point of equal height.

10. Allantoma lineata, nob.: *Couratari lineata*, Berg in Mart. Fl. Br. *l. c.* p. 508, tab. 7 et 77: arbor, ramulis teretibus, sulcatis, lenticellatis; foliis ovatis, vel oblongo-lanceolatis, imo obtusis, apice longissime et acutissime acuminatis, vix serrulatis, nervis plurimis, recte parallelis, suberecto-patulis, adscendentibus, impresso-immersis, costa parum prominente, utraque facie badiis concoloribus, costa nervis costatis venisque transversim reticulatis prominentibus; petiolo valido, canaliculato, limbo 8–12plo breviore: racemo fructifero e cicatricibus 12-floro: pyxidio sessili, cylindrico, basi rotundato, obsolete 5-sulcato, paullo sub apicem zona calycari lineari haud manifesta cincto; vitta interzonali brevissima, erecta, diametri 20mam partem alta; operculo ignoto; pericarpio ochraceo-opaco, intus cylindraceo, septorum vestigiis 5, et impressionibus seminum 4 in quoque loculo signato. In Brasilia, ad insulam Collares in delta Amazonica juxta Pará (*Pöppig*, 3636): *non vidi*.

The axils of its branches are $\frac{1}{2}$–$\frac{3}{4}$ in. apart; the leaves are 4–$8\frac{1}{2}$ in. long, $\frac{3}{4}$–$2\frac{3}{4}$ in. broad, on a petiole 6–8 lines long, with about 14 pairs of nerves, arcuately conjoined near the margin; the pyxidium (Plate LXV. fig. 4) in its full size, without the operculum, is $2\frac{3}{4}$ in. long, $1\frac{3}{4}$ in. in diam. above, a trifle narrower at the base; these are the dimensions given by Berg in the text, with which his figure does not quite agree.

11. Allantoma corbula, nob.: planta ignota: pyxidio oblongo, convexe ventricoso, imo rotundato, sursum gradatim angustiore, paullo sub apicem zona calycari lineari haud conspicua cincto; vitta interzonali erecto-conica, diametri 5–6tam partem alta; zona superiore circulari, integra, inferiore paullo minore; operculo ignoto; pericarpio crassiusculo, coriaceo-lignoso, cortice fusco-brunneo spisse suberoso longitudinaliter et transversim in frusta quadrantia rimoso tecto, intus demum cylindraceo, vestigiis septorum 5 intra faucem conjunctim arcuatis signato. In Brasilia: *v. s. in collect. Mus. Brit.* (sine indicat.).

The fruit (Plate LXV. fig. 10) is very distinct from all others of the genus in its very ventricose or lagenoid shape, with a very short interzonal band, and a thick cracking bark. It is $3\frac{3}{4}$ in. long, 2 in. in diam. above the base, narrowing to a breadth of $1\frac{1}{4}$ in. at the calycary zone, the interzonal band being $2\frac{1}{2}$ lines high; the upper zone is $1\frac{7}{8}$ in. in diam.; the pericarp is nearly 3 lines thick, and is borne upon a short thickish pedicel.

12. ALLANTOMA ? FAGIFOLIA, nob.: *Lecythis fagifolia*, Berg, Linn. xxvii. 451: ramulis gracilibus, striatis, fuscis, junioribus badiis, subpuberulis; foliis ovali-oblongis, imo sensim acutis, apice obtusule acuminatis, obsolete serrulatis, submembranaceis, glabris, supra nervis patule divergentibus et adscendentibus parum prominulis, reticulatis, costa plana, subtus pallidioribus, nervis costaque prominentibus; petiolo canaliculato, limbo 5–6plo breviore: racemis axillaribus et terminalibus, folio multo brevioribus; rachi subpuberula, multiflora; pedicellis longiusculis, gracilibus, puberulis; sepalis rotundatis, ciliatis; petalis ovalibus, tenuibus; ovario infero, turbinato, puberulo, 3-loculari, vertice plano, stigmate fere sessili. In Guiana Batava, ad ripas fluv. Marowyna (*non vidi*).

This plant cannot belong to *Lecythis*, owing to the absence of a style. I have referred it here because of its habit, its inflorescence with long slender pedicels, and the near obliteration of its style; it approaches *A. Burchelliana*, differing in the thinner texture of its smaller leaves, which are somewhat cuneate at base, its longer petiole, and shorter racemes. It is a tree with slender branchlets; leaves $2\frac{1}{2}$–4 in. long, $1\frac{1}{4}$–$1\frac{3}{4}$ in. broad, on a petiole 6–8 lin. long; racemes $\frac{3}{4}$–2 in. long; pedicels 9–11 lines long; sepals 1 line long; petals 8 lin. long; androphorum 5 lines in diam., with a ligula 1 in. long.

11. GRIAS. (Plate XXXVI. c).

The history of this genus and the account of its general structure has been given in a preceding page (p. 171); we have therefore only to delineate its generic character, and describe its species, noticing the similarity in the structure of its calyx to that of *Bertholletia*.

GRIAS, Linn.

Calophyllum (in parte), P. Brown; *Pirigara* (in parte), Aubl.

Calyx in alabastro globosus et indivisus, demum in sepala fissus: *sepala* 2 vel 4, subæqualia, oblonga, concava, rigida aut submembranacea, persistentia. *Petala* 4, alterna, oblonga, obtusa, marginibus subparallelis, æstivatione imbricata, unguibus inter discum et androphorum iis agglutinatis. *Discus* epigynus, annularis, planus. *Androphorum* depresse urceolatum, petalis dimidio brevius, centro excisum, margine subexpanso in appendiculas lineares breviusculis apice staminiferis fimbriato-incisum, intus appendiculis similibus incurvis pluriserialibus gradatim brevioribus crebris undique munitum: *filamenta* brevissima, tenuiter teretia: *antheræ* parvulæ, ovatæ, 2-lobæ, lobis didymis subglobosis, medio ad filamentum affixis, rima laterali longitudinaliter dehiscentibus, demum modo cymbali adpresse expansis. *Ovarium* inferum, hemisphæricum, subquadratum, 4-loculare, ovulis in quoque loculo plurimis, axi suspensis, vertice intra discum concavo, extus crenatim elevato, radiatim striato: *stylus* brevissimus, crassiusculus; *stigma* illo latius, sessile, depressum, ad medium 4-partitum, lobis cruciformibus, obtusis, rotatis, recurvatis. *Pyxidium* globosum, 4-sulcatum, aut ob-

longum, pyri mole, subrufum, et 8-sulcatum, paullo sub apicem *zona calycari* e sepalis persistentibus linea nexis coronatum; *vitta interzonalis* brevis; *zona superior* orbicularis; *operculum* conforme, depressum; *pericarpium* 4-loculare cum loculis 6–7-spermis, vel abortu 1-loculare et monospermum. *Semina* oblonga, funiculo magno carnoso suspensa; embryo amygdaloideus, edulis, textura homogenea, macropodus, in germinatione modo *Bertholletiæ* e duabus extremitatibus propullans.

Arbores *proceræ in America tropica et in Antillis vigentes*, trunco *sursum gradatim graciliore pro majore parte nudo, apice brevissime ramifero*; folia *magna, in apice ramorum creberrime approximata, cuneato-oblonga, subsessilia vel breviter petiolata, glaberrima*: flores *simpliciter pedicellati, plurimi, congesti, vel in pedunculo brevissimo subpaniculati, terminales, aut e trunco enati.*

1. Grias cauliflora, Linn. Sp. Pl. 732; Willd. Sp. Pl. ii. 1159; Swartz, Obs. p. 215; DC. Prodr. iii. 296; Lunan, Jam. i. 19; Smith in Rees's Cycl. vol. xvii.: *Anchovy-pear*, Sloane, Jam. ii. 122, tab. 216–217: *Calophyllum, sp.*, P. Brown, Jam. p. 245: procera, trunco erecto, sursum gradatim graciliore, subnudo, apice breviter ramifero et foliifero; foliis in apice ramorum creberrime approximatis, cernuis, oblongo- vel lanceolato-oblongis, imo sensim anguste cuneatis, apice obtuse attenuatis, et in acumen breve subacutum subito constrictis, integerrimis, vel in margine revoluto sæpe crenato-undulatis, rigidule chartaceis, supra viridibus, nervis plurimis, parallele divergentibus, juxta marginem nexis, venisque omnino immersis, subtus pallidioribus, valde opacis, ochraceo-brunneis, costa carinata nervisque prominentibus, venis nullis visibilibus; petiolo brevissimo, late marginato: floribus 5–6, odoratis, in gemma pedunculiformi trunco enata crebre congestis; pedicellis in alabastris subæquilongis, imo bracteola parva munitis; calycis laciniis oblongo-ovatis, obtusis, subcoriaceis; petalis 3plo longioribus, obtuse oblongis, concavis, crassiusculis, albis; androphoro petalis 3plo breviore, appendiculis 5-serialibus, sensim brevioribus, cunctis staminiferis: cætera ut in diagnosi generica. In Antillis: *v. s. in hb. Mus. Brit.*, Jamaica (*Swartz*).

The trunk, about 5 in. in diam., rises to heights of from 20 to 50 feet, tapering upwards almost to a point, bare nearly for its whole length, marked with the cicatrices of the fallen branches, and clothed near its summit with several very short branches, closely foliiferous; the aggregated leaves are pendent, from 8 to 36 in. long, $2\frac{1}{2}$–6 in. broad, on a short petiole, along which the limb is decurrent to the base; the pedicels of the clustered flowers are about 6 lines long, the flower expanded is about $1\frac{1}{2}$ in. in diam. Purdie saw the plant growing near Port Antonio in 1843 (Hook. Lond. Jo. Bot. iii. 533), with crowded fruits sessile on the trunk of the tree. The fruit (which I have not seen) is described by Lunan as of the size and shape of an alligator's egg, a little more attenuated upwards, where it is crowned by the persistent sepals, and of a brown russet colour; its mesocarp is 6 or 8 lines thick, soft-fleshy, and edible, enclosing a single oblong nut, which is 8-sulcated; but of its internal structure nothing is known.

2. Grias Aubletiana, nob.: *Gustavia tetrapetala*, Reusch, DC. Prodr. iii. 290: *Pirigara tetrapetala*, Aubl. Fl. Gu. i. 487, tab. 192 (synon. exc.): ramosa, ramulis griseis; foliis inferioribus subverticillatim confertis, superioribus alternis, amplis, sessilibus, oblongis, imo sensim spathulatis, apice gradatim acuminatis, serratis, supra viridibus,

lævibus, nervis plurimis divergentibus circa marginem adscendentibus, subtus costaque præsertim prominentibus, valde reticulatis : racemis axillaribus, rachi brevissima ad nodum pluribracteolatum reducta, sæpe 1-flora ; pedunculo quam flos breviore, supra medium bracteolis 2 parvis munito ; calycis limbo in lobos 4 fisso, lobis æqualibus, rotundatis, subconcavis, marginibus inflexis et undulatim crenatis, crassis, coriaceis, viridibus, intus albescentibus ; petalis 4, dimidio majoribus, æqualibus, crasse carnosulis, rotundato-ovatis, concavis, margine undulatis, expansis, candidis, ad unguem rubro-striatis ; androphoro brevi, imo cupulari, ad marginem et intus appendicibus numerosissimis breviusculis clavatis staminigeris munito ; antheris oblongis, 2-locellatis, rimis lateraliter dehiscentibus ; ovario infero, turbinato, ecostato, 4-loculari, ovulis in quoque loculo pluribus, funiculo supensis, vertice intra discum plano, stigmate sessili 4-lobo umbonato : pyxidio globoso, 4-sulcato, zona calycari e vestigiis loborum coronato ; vitta interzonali angustissima ; zona superiore integra ; operculo conformi, plano, stigmate umbonato ; pericarpio coriaceo, rufescente, sicco, 4-loculari ; seminibus in quoque loculo 6–7, oblongis, pressione subangulatis, funiculo majusculo carnoso contortuplicato suspensis ; embryone dicotyledoneo. In Guiana (Cayenne, *Aublet*) ; *non vidi.*

A species hitherto universally referred to *Gustavia*, but unquestionably belonging to *Grias*, there being scarcely any difference in the size, number, and disposition of the parts from the flower of *Grias Peruviana* and others. It is a small tree, about 20 feet high, having a trunk 3–4 inches in diam., with a softish white flexible wood, having a fetid odour. The larger leaves are more than a foot long, 4 in. broad, quite sessile, the upper ones alternate, about 1 in. apart, 7 in. long and 2 in. broad ; the pedicels are 9 lines long, surmounted by an ovary 4 lines long ; the sepals are $4\frac{1}{2}$ lines long and broad ; the petals 6 lines long and broad ; the androphorum 7 lines in diam., and 2–3 lines high ; the globular pyxidium, shown in Plate XXXVI., is nearly 3 inches in diam. (depicted half this size in Aublet's drawing) ; the seeds 16 lines long, each suspended by a funicle of nearly its size : the embryo is said to be amygdaloid.

3. Grias Fendleri, Seem. Bot. Her. p. 126 : glabra, foliis sessilibus, spathulato-oblongis, imo sensim cuneatis et in petiolo brevi seu costa decurrentibus, apice acuminatis, integerrimis, costa nervisque utrinque prominulis : racemis e trunco nascentibus ; rachi brevi ; floribus subsessilibus aut breviter pedicellatis ; calyce in alabastro globoso, demum in sepala 2 æqualia rotundata concava irregulariter fisso, his opacis, pallide flavidis, granulatis ; petalis 4 vel 5, obovato-oblongis, crassis, margine undulatis, utrinque granulatis ; androphoro cupulato, appendiculis numerosissimis, crebre pluriseriatis, in serie exteriore longioribus circa 24 æqualibus, subcontortim introflexis et conniventibus ; ovario infero, oblongo-turbinato, 4-gono, 4-loculari, ovulis plurimis axi centrali affixis, vertice intra discum subconico, radiatim striato ; stigmate umboniformi, cruciatim 4-lobo. In Panamá : *v. v. in hb. Hook.*, Chagres (*Fendler*, 185).

This species is found in the forests of Panama, where it is a tree with sessile leaves 18–24 in. long, 6–8 in. broad, having about 38 pairs of nerves, and much resembling

those of *Cespidesia macrophylla*, Seem. The pedicels are 9 lines long, angulately striated, with a basal bract 1 line long; the flowers are 1–1½ in. broad; petals coriaceous, with imbricate æstivation; the androphorum bears about 100 staminiferous appendages; the ovary is 7 lines long, 4 lines broad.

4. Grias Peruviana, nob.: foliis majusculis, spathulato-oblongis, longe supra medium amplioribus, imo sensim angustissimis, in petiolo decurrentibus, apice in acumen angustum acutum abrupte constrictis, marginibus subrevolutis sinuato-serratis, chartaceis, supra pallidis, opacis, nervis plurimis rectis, parallele divergentibus, et in nervum marginalem terminantibus, nervis costaque paullo prominentibus, venis transversis tenuiter reticulatis, subtus fuscioribus, pallide brunnescentibus, subopacis, nervis subtenuibus costaque brunnea prominentibus, venis immersis; petiolo subtenui, tereti, marginibus late foliosis reflexis, ochraceo-granulato, limbo 20plo breviore: racemis plurimis fasciculatis, brevibus, e trunco enatis; pedunculo brevi, vel in nodum imbricatim bracteolatum reducto, 3-floro; pedicellis tenuibus, calyce 3plo longioribus, imo 2-bracteolatis; calyce primum subgloboso, demum in sepala 4 æqualia ovata submembranacea fisso; petalis 4, æqualibus, sepalis 5plo longioribus, oblongis, obtusis, imo latioribus, crassis, marginibus undulatis; androphoro brevi, cupulari, appendiculis numerosis, pluriserialibus, in serie exteriore longioribus, petalis 4plo brevioribus; ovario infero, sepalis 3plo breviore, granulatim maculato, semigloboso, 4-costato, scabridulo, 4-loculari, ovulis in quoque loculo pluribus, apice suspensis, vertice intra discum latum subconcavum; stylo brevi, late conico, stigmatis lobis 4, horizontaliter radiantibus. In alta Peruvia: *v. s. in hb. Hook.*, Tarapota (*Spruce*, 4541); Rio de la Ventana (*Spruce*).

A tree 20–40 feet high, with few elongated branches, terminated by several approximated large leaves; the leaves are 18–27 in. long, 3½–6 in. broad, on a petiole with broadly decurrent reflexed margins 1¼ in. long; the peduncle is about 3 lines long; pedicels 1–1¼ in. long; the sepals 1½ line long, 2 lines broad; petals 7 lines long, 5 lines broad; androphorum 5 lines in diam.; fruit large, with an edible pulp.

12. Cercophora (Plate XXXVI. B).

The outlines of this remarkable and abnormal genus have been previously given (page 172).

Cercophora, nob.

Sepala 6, subæqualia, ovata, margine denticulata. *Petala* 6, sepalis 6plo longiora, subinæqulia, submembranacea, oblonga, patentia, unguibus inter discum et androphorum insinuatis et cum iis agglutinatis. *Discus* epigynus, planus, annularis. *Androphorum* petalis vix majus, imo cupulatum, centro excisum, intus appendicibus staminiferis brevibus numerosissimis 5-serialibus munitum, latere antico in *ligulam* subæquilatam carnosulam incurvatam pro majore parte appendicibus similibus crebre tectam, et inde in galeam singularem latam expansum: *galea* ligula latior, e laminis 2 crassiusculis marginibus coalitis et marsupium compressum ore aperto fingens, lamina interna nuda, exteriore intus nervis plurimis longitudinaliter parallelis signata, apice subito constricta, in lorum longum

anguste lineare incurvum prolongata. *Stamina* parva, singula apice appendiculæ tenuiter longiusculæ clavatæ insita; *filamentum* brevissimum, filiforme; *anthera* didyma, lobis subglobosis, rima longitudinali lateraliter dehiscentibus: *ovarium* inferum, semiglobosum, 3-loculare, *ovulis* in quoque loculo plurimis, ad axin circa basin affixis, suberectis, *vertice* intra discum planum subconvexo, radiatim striato; *stylus* subulato-teres, sepala paullo excedens, subcurvatus; *stigma* minutum sub-3-lobum, papillosum.

Arbor *Amazonica, de qua nihil nisi* flos *cognatum est.*

1. Cercophora anomala, nob.: planta et inflorescentia ignota: sepalis 6, ovalibus, extus subcarinatis, minute granulatis, fusco-opacis, marginibus late membranaceis et ciliato-denticulatis; petalis 6, spathulato-obtusis, rotundatis, inæqualibus, sepalis 6plo longioribus, submembranaceis, siccis flavis; ovario parvo, turbinato. In regione Amazonica: *v. florem s. in hb. meo*, San Carlos, Rio Negro (*Spruce*).

As mentioned in a preceding page (p. 172), I found this single flower entangled in the panicle of my specimen of *Chytroma Spruceana* (Spruce, 3695) from San Carlos, on the upper branch of the Rio Negro, just within the confines of Venezuela. The pedicel is $1\frac{1}{2}$ line long; the sepals $1\frac{1}{2}$ line long, 1 line broad; the larger petals are 8 lines long, 6 lines broad; the androphorum coiled up, $4\frac{1}{2}$ lines in diameter, expanded 9 lines long.

This singular genus seems to approach *Cariniana* in its 3-locular ovary, erect ovules, and long style, and to agree generally in its floral parts; but it differs in its androphorum, unilaterally expanded by the addition of its anomalous purse-shaped hood.

DESCRIPTION OF THE PLATES.

Plate XXXIII.

Section A. Analysis of *Gustavia*.

Fig. 1. The androphorum of *G. Marcgraaviana*, seen from beneath, with one of the petals attached to its base (the others removed).

Fig. 2. The same, shown laterally.

Fig. 3. The same, seen from above.

Fig. 4. The ovary, surrounded by the sepals, to show the epigynous annular disk to which the androphorum is agglutinated by the intervention of the claws of the petals.

Fig. 5. A longitudinal section of the flower, showing the relative position of the above parts, and their attachment to the disk; the inferior ovary is also seen where ovules, supported by funicles, radiate from the central axis: *all nat. size.*

Fig. 6. One of the outer and one of the inner row of the many-seried staminiferous appendages of the androphorum: *magnified.*

Fig. 7. Summits of 2 of the appendages, seen before and behind, showing how they support the filaments and anthers, and the peculiar mode of dehiscence of the latter: *more highly magnified.*

Fig. 8. One of the seeds suspended by its spirally twisted fleshy funicle of nearly equal size: it is drawn from a specimen preserved in spirits in the Kew Museum, and from another in the British Museum, sent by Lockhart.

Fig. 9. Half of its testa removed, to show the enclosed embryo.
Fig. 10. The embryo, consisting of 2 large fleshy cotyledons, with an imbedded small superior radicle.
Fig. 11. One of the cotyledons, showing the position of the radicle: *all nat. size.*

Section B. Analysis of *Couroupita.*

Fig. 1. A flower expanded of *C. Peruviana.*
Fig. 2. The ovary invested by the calyx, and margined by 6 sepals, seen sideways.
Fig. 3. The same, seen from above.
Fig. 4. A longitudinal section of the same, showing several ovules in each cell, radiating from the central axis: *all nat. size.*
Fig. 5. The annular epigynous disk surrounding the raised pulvinated vertex of the ovary, hollow in the centre, where there is a short thick style, surmounted by a depressed 6-rayed stigma.
Fig. 6. A transverse section of the inferior 6-celled ovary, with ovules attached: *both magnified.*
Fig. 7. The androphorum seen sideways, with the numerous staminiferous appendages upon its basal ring, and others in densely imbricated series within its inverted semiglobular hood.
Fig. 8. The same straightened, to show the bare ligula which intervenes between the basal ring and the hood, both of which are charged within with numerous staminiferous appendages in closely imbricated series: *both nat. size.*
Fig. 9. Three of the appendages of the hood.
Fig. 10. Two of the appendages of the basal ring: *both magnified.*
Fig. 11. Summit of one of the same, showing how the short filament is inserted upon it.
Fig. 12. An anther: *all magnified.*
Fig. 13. One of the many seeds of *C. Guianensis,* copied from Poiteau's drawing. It is covered by a pubescent brittle testa, supported by a short funicle and imbedded in pulp.
Fig. 14. The testa splitting, to allow the embryo to escape.
Fig. 15. The embryo enclosed within the testa, showing the two plicated ascending foliaceous cotyledons, similar in length to the terete radicle, curved below, and pointing upwards to the hilum.
Fig. 16. The exalbuminous embryo expanded: *all nat. size.*

Section C. Analysis of a flower of *Bertholletia nobilis.*

Fig. 1. A flower in bud, showing its entire floral globular calyx, which conceals the other parts.
Fig. 2. A flower of full size and in its expanded state.
Fig. 3. The calyx, which splits into two semiglobular segments, each tridentate at the apex.
Fig. 4. The same, seen from above, showing the epigynous annular disk and the vertex of the inferior ovary.
Fig. 5. A longitudinal section of the same, with the ovules in each cell attached to the central axis.
Fig. 6. A transverse section of the inferior ovary, showing its 4 cells.
Fig. 7. The androphorum in its natural shape.
Fig. 8. The same somewhat straightened, to show the bare ligula between the basal ring and concave hood, which are both densely charged with numerous appendages, all seen sideways.
Fig. 9. The same, seen from within: *all nat. size.*
Fig. 10. Three of the appendages of the hood, bare of stamens.
Fig. 11. Three of the appendages of the basal ring, all bearing fertile stamens: *both magnified.*
Fig. 12. An erect triquetral seed, showing the hilum at the lower ventral angle.
Fig. 13. The thick ligneous testa in a longitudinal section, showing one of the channels which are filled with the main chords of the ascending raphe.

Fig. 14. A transverse section of the same, showing the channels with the three main cords of the imbedded raphe in the three angles.

Fig. 15. The edible nucleus, removed from fig. 13. This is the ordinary well-known Brazil-nut.

Fig. 16. A transverse section of the same, seen sideways.

Fig. 17. The same, seen from above, showing in its summit the traces of the almost obsolete minute cotyledons.

Fig. 18. A longitudinal section of the same embryo, showing it to be a gigantic radicle, with an external exorhiza surrounding an internal neorhiza.

Fig. 19. The same in a state of germination, as seen in a specimen preserved in spirits in the Kew Museum : *all nat. size.*

Plate XXXIV.

Section A. Analysis of *Lecythis*.

Fig. 1. A flower expanded.

Fig. 2. The inferior ovary surmounted by 6 sepals, viewed sideways.

Fig. 3. The same, seen from above, showing within the sepals the epigynous disk that encircles the elevated vertex of the ovary : *all nat. size.*

Fig. 4. A transverse section of the inferior ovary, usually 4-celled.

Fig. 5. A longitudinal section of the same, showing also the sepals, disk, vertex, and style, with several ovules in each cell, suspended by funicles from the middle or summit of the central axis : *both somewhat magnified.*

Fig. 6. The androphorum removed, showing its inverted head.

Fig. 7. The same straightened, to show the bare ligula between the basal staminiferous ring and the hood echinated inside with very numerous staminiferous appendages.

Fig. 8. The same viewed sideways, to show the basal ring where it is agglutinated to the disk by the intervening claws of the petals.

Fig. 9. Three of the staminiferous appendages of the hood.

Fig. 10. Three of the same belonging to the basal ring : *all nat. size.*

Fig. 11. Three of the appendages of the hood, enlarged, showing the anthers fixed on their summits.

Fig. 12. Those of the basal ring, with the anthers before and after dehiscence : *all magnified.*

Fig. 13. One of the seeds suspended within the fruit by a large fleshy funicle, which is attached to the summit of the solid columella descending from the operculum : this is more clearly shown in Plate LVI.

Fig. 14. A seed without the funicle.

Fig. 15. A longitudinal section of its thick coriaceous or ligneous testa, with its enclosed nucleus.

Fig. 16. A transverse section of the same, showing the several cords of the branching imbedded raphe.

Fig. 17. The nucleus removed, which is the ordinary Sapucaya nut ; it is a homogeneous embryo or gigantic radicle, like that of *Bertholletia*.

Fig. 18. The same, seen below, to show the almost obliterated basal minute cotyledons.

Fig. 19. A transverse section of the same, showing the neorhiza surrounded by the external exorhiza.

Fig. 20. The same germinating. This I found in the fruit of *L. Marcgraaviana* : *all nat. size.*

Section B. Analysis of *Chytroma*.

Fig. 1. A flower expanded, with the androphorum removed to show the sepals and petals.

Fig. 2. The calyx and semiinferior ovary : *both nat. size.*

Fig. 3. The same, enlarged, to show the annular disk which encircles the elevated vertex of the ovary, terminated by a short umboniform style.

Fig. 4. A longitudinal section of the same, showing the ovary to be half-superior, and that its ovules are erect in the base of the cells.

Fig. 5. A transverse section of the same above the level of the disk, as seen from above, surrounded by the expanded calyx; the ovary is 4-celled, and its ovules always erect and sessile: *all magnified.*

Fig. 6. The androphorum: *nat. size.*

Fig. 7. An enlarged view of the same, showing its inverted hood.

Fig. 8. The same straightened, to show the staminiferous appendages of the basal ring, the bare ligula, and the hood densely echinated within, with sterile appendages.

Fig. 9. The same, viewed sideways: *all magnified.*

Fig. 10. Some of the sterile appendages of the hood.

Fig. 11. Some of the fertile appendages of the basal ring: *both more or less magnified.*

Fig. 12. A seed, seen on its dorsal face, showing the cancellated bars of the imbedded branching raphe.

Fig. 13. The same, viewed on its ventral face, showing the basal hilum, from which ascends the main branch of the raphe-like fillet with its edges free, but adhering to the testa by a linear nerve.

Fig. 14. The same with half of the testa removed, showing its thin brittle texture, and the prominent main branch of the raphe, the enclosed embryo being contracted by drying.

Fig. 15. The lower moiety of the testa, seen from above, with a portion of the fillet of the raphe thrown back.

Fig. 16. The nucleus, removed, which is solid, of a dark colour, very bitter in taste, and homogeneous in texture.

Fig. 17. A longitudinal section of the same, showing its structure to be analogous to that of *Lecythis,* but with a much thicker exorhiza, which leaves an open fissure between it and the neorhiza: *all nat. size.*

Section C. Analysis of *Eschweilera.*

Fig. 1. A flower expanded.

Fig. 2. The inferior ovary, showing the 6 sepals, the annular disk which surrounds its elevated vertex, and the umboniform style: *both nat. size.*

Fig. 3. An enlarged view of the same, from above.

Fig. 4. A transverse section of the same, showing it to be 2-celled.

Fig. 5. A longitudinal section of the same, showing the cells to be half-superior, with several ovules in each cell, always erect and sessile in its base: *all magnified.*

Fig. 6. The androphorum.

Fig. 7. The same straightened and seen from within, showing its basal ring covered by numerous short staminiferous appendages, the intervening bare ligula and the semiglobular head, which is densely echinated inside with many imbricated appendages, most frequently sterile; but sometimes, though rarely, they bear fertile stamens.

Fig. 8. Some of the sterile appendages of the hood.

Fig. 9. Some of the fertile appendages of the basal ring: *all nat. size.*

Fig. 10. Two of the same appendages, bearing short filaments and anthers, shown before and after dehiscence: *magnified.*

Fig. 11. A seed, shown on its dorsal face, and having a granularly scrobiculate surface, swelling transversely below the middle.

Fig. 12. The same, seen edgeways, showing the basal hilum, from which the sulcated branches of the imbedded raphe are seen to furcate.

Fig. 13. The same, shown on its ventral face, where the main sulcated branch of the raphe aacends from the hilum, and from which other sulcated branches are spread.

Fig. 14. A longitudinal section of the same, showing its thick coriaceous testa, in the substance of which the branching raphe is imbedded: within it is a lax thin integument, and a smaller nucleus much contracted in drying, flat on the ventral face, where it and the integument adhere slightly to the testa.

Fig. 15. A transverse section of the same, showing the same parts.
Fig. 16. The lax inner integument and the smaller nucleus, shown in longitudinal section.
Fig. 17. The same in transverse section.
Fig. 18. The pale integument cut open, showing where it is coated within by a grey pulverulence, and one side is charged with clots of black powdery matter.
Fig. 19. The dark bitter nucleus, seen on its dorsal face.
Fig. 20. The same, shown edgeways.
Fig. 21. A longitudinal section of the same, showing its homogeneous texture, its thickish exorhiza often separated by a fissure from the internal neorhiza, a structure analogous to that of *Chytroma*.
Fig. 22. A transverse section of the same: *all nat. size.*

Plate XXXV.

Section A. Analysis of *Jugastrum*.

Fig. 1. A flower before expansion.
Fig. 2. The same after expansion.
Fig. 3. The 6 sepals, the annular disk, and elevated vertex of the ovary, terminated by a very short style.
Fig. 4. A longitudinal section of the ovary, which is 2-celled, the vertex dome-shaped, the cells half-superior, with several ovules erect in the base of each cell.
Fig. 5. A transverse section of the same, showing it to be 2-celled, with several ovules erect in each cell.
Fig. 6. The androphorum, with a convex hood.
Fig. 7. The same straightened and viewed from the inside, showing the many staminiferous appendages on its basal ring, its bare ligula, and its hood echinated with very numerous staminiferous appendages.
Fig. 8. The appendages of the hood.
Fig. 9. Those of the basal ring: *all nat. size.*
Fig. 10. The staminiferous appendages of the hood.
Fig. 11. Those of the basal ring, with the anthers before and after dehiscence: *both magnified.*
Fig. 12. A seed of *J. obtectum*.
Fig. 13. A longitudinal section of the same, showing its thin coriaceous testa, smooth outside, granulated within.
Fig. 14. A lower moiety of the same in transverse section.
Fig. 15. The nucleus or embryo, with a granulated surface, nearly filling the testa, with a split nipple in the middle of the ventral angle.
Fig. 16. A longitudinal section of the same, showing it to be homogeneous in texture; it is of a darkish colour, with an external exorhiza, very thin near the nipple, and opposite a protuberance of the neorhiza: *all nat. size.*
Fig. 17. The same, *magnified.*
Fig. 18. The macropodous embryo in germination: *nat. size*, after Berg.
Fig. 19. The compressed seed of *J. platyspermum*, seen on the ventral face.
Fig. 20. The same, seen edgeways.
Fig. 21. A transverse section of the testa.
Fig. 22. A longitudinal section of the nucleus: *all nat. size.*

Section B. Analysis of *Couratari*.

Fig. 1. A flower expanded: *nat. size.*
Fig. 2. The inferior ovary, 6 free sepals, the annular epigynous disk, the elevated pulvinated and crenated vertex, hollow in the middle, where there is a broad conical short style, surmounted by a hollow globular stigma.

Fig. 3. A longitudinal section of the same, showing several ovules erect in the basal angle of each cell.
Fig. 4. A transverse section of the same, which has 3 cells, with erect ovules: *all somewhat magnified.*
Fig. 5. The androphorum, viewed sideways.
Fig. 6. The same straightened, to show the basal ring charged with staminiferous appendages, the long intervening bare ligula, and the reversed hood attached by a fleshy knob in the summit of the ligula, the hood being echinated *outside* (contrary to the general rule) with numerous sterile appendages.
Fig. 7. Three of the appendages of the hood.
Fig. 8. Three of the staminiferous appendages of the basal ring: *all nat. size.*
Fig. 9. Two of the same, with the anthers before and after dehiscence: *magnified.*
Fig. 10. A seed, which is much compressed, with a broad circumambient membranaceous wing, placed round an oblong testaceous escutcheon.
Fig. 11. The same, seen edgeways.
Fig. 12. The very thin inner integument, which fills the escutcheon and encloses the exalbuminous embryo.
Fig. 13. The embryo removed, showing its form when embraced by the integument.
Fig. 14. The same expanded to exhibit the long terete club-shaped radicle pointing to the basal hilum, and shortly curved at its upper extremity, where it is continuous with 2 broad plicated foliaceous cotyledons equal to it in length: *all nat. size.*

Section C. Analysis of *Cariniana*.

Fig. 1. A flower: *nat. size.*
Fig. 2. The same: *greatly magnified.*
Fig. 3. Two of the six petals, seen from within and sideways.
Fig. 4. The inferior ovary, seen from above: *all equally magnified.*
Fig. 5. A vertical section of the same, showing the 6-dentate cupular free border of the calyx, the annular disk, the somewhat concave vertex, the long terete style, the inferior cells containing few or more erect ovules fixed near their base.
Fig. 6. A transverse section of the same, showing the three cells and the ovules in each: *both more magnified.*
Fig. 7. The androphorum, on the same scale as fig. 2, showing its very gibbous tubular form, slightly convex at its summit; it is fringed on the margin and echinated over its whole surface inside, with staminiferous appendages in many series, and has no basal ring or ligula: in this respect it approaches *Gustavia* and *Grias*.
Fig. 8. The same, seen sideways.
Fig. 9. The same cut open, to show the many series of staminiferous appendages, the upper ones being longest, the others gradually shortening in length to that of the lower short series: *magnified.*
Fig. 10. The appendages of the upper and lower series: *more magnified.*
Fig. 11. The same: *more magnified.*
Fig. 12. The same, with the anthers after dehiscence, seen sideways and from above.
Fig. 13. The stigma and part of the style: *magnified.*
Fig. 14. A seed, seen in front, with its long basal membranaceous wing and the apical embryoniferous escutcheon.
Fig. 15. The same, seen edgeways.
Fig. 16. The very thin inner integument removed from the escutcheon, the space of which it fills.
Fig. 17. The embryo, removed from that integument, consisting of a terete descending radicle pointing to the basal hilum, curved suddenly at its summit, and continuous with the descending cotyledons: *all nat. size.*

Fig. 18. The same, with the cotyledons expanded, which are foliaceous, plicated, and shorter than the radicle: *magnified*.

Plate XXXVI.

Section A. Analysis of *Allantoma*.

Fig. 1. A flower: *nat. size*.
Fig. 2. An enlarged view of the same.
Fig. 3. The six unequal petals, removed.
Fig. 4. The inferior ovary surmounted by six free sepals and the annular epigynous disk, which surrounds the vertex and umbonate style.
Fig. 5. A longitudinal section of the same.
Fig. 6. A transverse section of the same in the instance where it is 4-celled.
Fig. 7. The same where it is 3-celled; in other species it is 5-celled.
Fig. 8. The androphorum in its natural form, partially opened to show the several convolutions of the ligula and the semiglobular hood, bare of appendages on both faces, though they are seen along its margins.
Fig. 9. The same, with the ligula partly straightened, seen from within.
Fig. 10. The same, viewed externally, where the last convolution is reversed in a contrary direction.
Fig. 11. The same, viewed externally, where the ligula is further straightened and biplicated, and showing how the bare hollow hood is reversed upon the extremity of the ligula: *all magnified on the same scale*.
Fig. 12. One of the seeds, on its dorsal face.
Fig. 13. The same, seen sideways.
Fig. 14. The same, shown on its smoother ventral face, where the position of the hilum is seen on one of its basal auricles.
Fig. 15. The same, with half of the thick subcoriaceous testa removed to show the relative form and size of the enclosed nucleus.
Fig. 16. The nucleus removed, seen on its face.
Fig. 17. The same, seen edgeways.
Fig. 18. A transverse section of the same: *all nat. size*.
Fig. 19. A longitudinal section of the nucleus, showing the exorhiza enveloping the neorhiza: *magnified*.

Section B. Analysis of *Cercophora*.

Fig. 1. A flower expanded: *nat. size*.
Fig. 2. One of the six petals.
Fig. 3. The inferior ovary surmounted by a border of six free expanded sepals: *all nat. size*.
Fig. 4. The same, showing the annular disk, flat vertex, and long terete style.
Fig. 5. A longitudinal section of the same, omitting the sepals, showing the cells of the inferior ovary, with its ovules erect from the base.
Fig. 6. A transverse section of the same, to show its three cells: *all magnified*.
Fig. 7. The androphorum.
Fig. 8. The same straightened: *both nat. size*.
Fig. 9. The same, enlarged, showing the inversion of its hood and the further inflexion of its caudal extension.
Fig. 10. The same straightened, seen from within, showing the usual basal ring, with a short incurved ligula, both charged with staminiferous appendages, and the bare sacciform hood with its caudal extension.

Fig. 11. A longitudinal section of the same, seen edgeways, showing the hollow purse-shaped hood and its caudal extension.

Fig. 12. The same, with the inner face of the hood cut through and thrown back to show its peculiar nervation: *all magnified.*

Fig. 13. One of the staminiferous appendages: *nat. size.*

Fig. 14. The same, *magnified.*

Fig. 15. A portion of the style and stigma: *magnified.*

Section C. Analysis of *Grias.*

Fig. 1. A flower of *Grias Peruviana* in bud, closed by the entire globular limb of the calyx.

Fig. 2. The same after expansion, the calycine limb now split into 4 equal sepals: *both nat. size.*

Fig. 3. The same, enlarged, showing the inferior ovary, the 4 sepals, and the 4 equal petals somewhat larger than the sepals.

Fig. 4. The same, seen from above, showing the petals surrounding the androphorum.

Fig. 5. The inferior ovary, surmounted by the four sepals, the annular disk, and the umbonated vertex.

Fig. 6. A transverse section of the ovary, showing it to be 4-celled.

Fig. 7. A longitudinal section of the same, with the ovules in the cells: *all somewhat magnified.*

Fig. 8. The same, showing more distinctly the annular disk with its crenulated margin surrounding the concave vertex, the umboniform style, surmounted by the sessile 4-rayed stigma, the ovules in each cell suspended by funicles from the top of the axile column.

Fig. 9. The stigma: *both more highly magnified.*

Fig. 10. The androphorum in its natural shape, consisting of a shallow basal cup, regular in form, bordered by the external series of much longer staminiferous appendages.

Fig. 11. The same cut open, to show how it is covered internally with several series of staminiferous appendages, the lower one short, the others gradually longer, the external series longest: *both little magnified.*

Fig. 12. Two of the same appendages, which are somewhat incurved, subtetragonous, truncated at the summit, where the filaments are inserted: *more magnified.*

Fig. 13. A stamen, with two oval anther-cells, almost disjointed, upon the apex of the filament.

Fig. 14. The same after dehiscing laterally by a longitudinal suture: *both more highly magnified.*

Fig. 15. A fruit of *Grias Aubletiana,* drawn in its natural dimensions as given in the text of Aublet, and copied from his drawing, stated to be half-size.

Fig. 16. A transverse section of the same, showing it to be indehiscent and 4-celled, each cell containing 6 or 7 seeds.

Fig. 17. One of the seeds suspended by a fleshy funicle, as in *Gustavia: all nat. size.*

Plate XXXVII.

Represents the fruit of two species of *Bertholletia.*

Fig. 1. The pyxidium of *B. excelsa,* from a specimen in the Kew Museum, collected by Purdie in the island of Trinidad: it corresponds well with Bonpland's figure of his specimen from the river Orinoco.

Fig. 2. A section of the upper part of the shell, showing the form of the opercular opening.

Fig. 3. The extruding operculum, which naturally breaks off from the summit of the internal columella, as seen in the Kew specimen and in Bonpland's drawing.

Fig. 4. The pyxidium of *B. nobilis,* from Pará, from specimens sold in London shops. This is distinguished by its smaller and more globular form, its darker thick coriaceous bark, which splits and falls away in fragments.

Fig. 5. A section of the upper part of the shell, showing the difference in its opercular opening.
Fig. 6. The incarcerated depressed operculum.
Fig. 7. A cluster of five seeds, not quite ripe, the contents of one of the cells, fixed by their basal angle to a portion of the columella. There is here no trace of any pulp, which Berg asserts to surround the seeds; the specimen is in the Museum of the Linnean Society : *all nat. size*.

Plate XXXVIII.

Fig. 1. The pyxidium of *Lecythis ampullaria*, from a specimen in the Kew Museum. One quarter-segment is taken away, to show the size of the cavity and the thickness of its shell.
Fig. 2. A seed in the Kew Museum, brought by Triana from Nueva Granada.

Plate XXXIX.

Fig. 1. The pyxidium of *Lecythis urnigera*, procured by myself and others in Rio de Janeiro, where they are sold in the open market.
Fig. 2. One of its seeds, suspended by its white fleshy funicle, from a drawing made by me while in the fresh state; its nucleus is edible, and called *Supucaya* : *both nat. size*.

Plate XL.

Fig. 1. The pyxidium of *Lecythis Velloziana*, from a specimen belonging to Mrs. Fry, who obtained it in Rio de Janeiro; it agrees sufficiently with the rude drawing in the 'Flora Fluminensis,' where the operculum is wanting.
Fig. 2. One of its seeds : *both nat. size*.

Plate XLI.

The pyxidium of *Lecythis Bogotensis*, from a specimen from Bogota iu the British Museum : *nat. size*.

Plate XLII.

Fig. 1. The pyxidium of *Lecythis vasiformis*, from 2 specimens obtained in Rio de Janeiro by Mrs. Fry, and now in her possession.
Fig. 2. One of its seeds.
Fig. 3. The pyxidium of *Lecythis pilaris*, from a specimen brought from Rio de Janeiro by Mrs. Fry; the operculum has been lost : *all nat. size*.

Plate XLIII.

Fig. 1. The pyxidium of *Lecythis ampla*, from a specimen in the Kew Museum, sent from Antioquia, in New Granada.
Fig. 2. One of its seeds.
Fig. 3. The pyxidium of *Lecythis minor*, from two specimens in my possession, said to come from Costa Rica, but probably from Cartagena, as it corresponds with Jacquin's drawing : *all nat. size*.

Plate XLIV.

Fig. 1. The pyxidium of *Lecythis validissima*, from a specimen in the Kew Museum, obtained from a tree growing in Mauritius, and introduced from Guiana; another specimen is in the British Museum, from Guiana, which exactly corresponds in size and shape with the above.
Fig. 2. One of its seeds : *both nat. size*.

Plate XLV.

Fig. 1. The pyxidium of *Lecythis lacunosa*, from a specimen in the British Museum brought from Brazil by Capt. Burton. I have two specimens of the same from Rio de Janeiro. There are also two other specimens in the Kew Museum, one of which has its interzonal band depressed below the level of the calycary zone; but as it agrees with the above in other particulars, I have referred it here.

Fig. 2. A seed of the same: *both nat. size.*

Plate XLVI.

The fruits of *Lecythis lanceolata*, Poir. (non Berg).

Fig. 1. The pyxidium from a specimen in the Kew Museum, from a Guiana tree cultivated in the Mauritius. There is another specimen, somewhat broader in proportion, in the same Museum, probably indigenous and from Dutch Guiana.

Fig. 2. An unripe specimen in the British Museum, sent from Ile Bourbon, there cultivated and introduced from Guiana; its operculum is higher and more convex: *both nat. size.*

Plate XLVII.

Fig. 1. The pyxidium of *Lecythis Zabucayo*, from a specimen in the Kew Museum, sent by a collector from Hamburg, probably derived from Guiana.

Fig. 2. Two of its seeds, seen in front and sideways.

Fig. 3. The pyxidium of *Lecythis usitata*, from a specimen in the Kew Museum, sent from Pará by Dr. Spruce. Its operculum has been lost.

Fig. 4. One of the seeds. This quite resembles in size and form the Sapucaya nuts sold in the London shops, and imported from Pará: *all nat. size.*

Plate XLVIII.

Fig. 1. The pyxidium of *Lecythis Marcgraaviana*, from a specimen in the Museum of the Linnean Society.

Fig. 2. One of its seeds.

Fig. 3. The pyxidium of *Lecythis Pohlii*, copied from the drawing of Berg.

Fig. 4. One of its seeds: *all nat. size.*

Plate XLIX.

Fig. 1. The pyxidium of *Lecythis densa*, from a specimen in the British Museum, derived from Sloane's collection.

Fig. 2. The pyxidium of *Lecythis cupularis*, from a specimen in the Kew Mnseum, probably from the province of Pará.

Fig. 3. The pyxidium of *Lecythis lævicula*, from a specimen in the Kew Museum sent from Demerara: *all nat. size.*

Plate L.

The pyxidium of *Lecythis Pisonis*, copied from Berg's drawing, with the addition of its operculum, as described in his text: *nat. size.*

Plate LI.

Fig. 1. The pyxidium of *Lecythis sphæroides*, from a specimen in my own collection: *nat. size.*

Fig. 2. The pyxidium of *Lecythis elliptica*, from a specimen in the Kew Museum, sent, together with the

dried plant, by Purdie, the latter agreeing well with Kunth's description of his plant from the same locality.

Fig. 3. The pyxidium of *Lecythis dubia*, from a specimen in the Kew Museum, also sent by Purdie, from the locality indicated by Bonpland: *all nat. size.*

Plate LII.

Fig. 1. The pyxidium of *Lecythis biserrata*, from a drawing made by Dr. Berg from a specimen from Rio de Janeiro, which he wrongly referred to *Lecythis lanceolata*, Poir., a Guiana species, and also to *Lecythis minor*, Vell. (non Jacq.). I have added to Berg's drawing the operculum there omitted, but which he describes in his text.

Fig. 2. The pyxidium of *Lecythis platyzone*, from the description given by Berg: *both nat. size.*

Plate LIII.

Fig. 1. The pyxidium of *Lecythis limbata*, from a specimen in the British Museum; the operculum has been lost: *nat. size.*

Fig. 2. A view of the same from above, to show the contour of its calycary zone: *half its nat. size.*

Plate LIV.

Fig. 1. The pyxidium of *Lecythis crassinoda*, from a specimen in the British Museum: *nat. size.*

Fig. 2. The same, seen from above, to show the outline of its calycary zone: *reduced to half-size.*

Fig. 3. One of its seeds: *nat. size.*

Plate LV.

Fig. 1. The pyxidium of *Lecythis venusta*, from a specimen in the Kew Museum and my own collection: *nat. size.*

Fig. 2. The same, seen from above, to show the form of the calycary zone: *reduced to half-size.*

Fig. 3. One of its seeds.

Fig. 4. The pyxidium of *Lecythis tumefacta*, from a specimen in the Kew Museum and another in my own collection: *both nat. size*.

Fig. 5. The same, seen from above, to show the outline of the calycary zone: *reduced to half-size.*

Fig. 6. One of its seeds: *nat. size.*

Plate LVI.

Fig. 1. The pyxidium of *Lecythis tuberculata*, from a specimen in my own collection: *nat. size.*

Fig. 2. The same, seen from above, to show the form of the calycary zone: *reduced to half-size.*

Fig. 3. One of the seeds suspended by its fleshy funicle: *nat. size.*

Fig. 4. The pyxidium of *Lecythis Coxiana*, from two dried specimens, and another preserved in spirits, in my own collection, showing one of its cells, and its seeds suspended by their fleshy funicles in their true position: *nat. size.*

Fig. 5. The same, seen from above, showing the peculiar contour of its calycary zone: *reduced to half-size.*

Plate LVII.

Fig. 1. The pyxidium of *Lecythis grandiflora*, copied from Aublet's drawing, and restored to the dimensions given in the text: *nat. size.*

Fig. 2. The same, seen from above : *half nat. size.*

Fig. 3. One of its seeds : *nat. size.*

Fig. 4. The pyxidium of *Lecythis variolata,* from 4 specimens in my own collection.

Fig. 5. The same, seen from above, with the operculum removed, showing the outline of its calycary zone : *reduced to half nat. size.*

Plate LVIII.

Fig. 1. The pyxidium of *Chytroma Schomburgkiana,* from a specimen in the Kew Collection, partly in longitudinal section.

Fig. 2. The same, seen from above, after the removal of the operculum, showing it to be 4-celled.

Fig. 3. The pyxidium of *Chytroma incarcerata,* partly in longitudinal section, showing that, the velarium being broader than the zonal aperture, the operculum cannot fall off.

Fig. 4. The operculum of the same released, shown sideways, connected with the four dissepiments.

Fig. 5. One of its erect seeds : *all nat. size.*

Fig. 6. The pyxidium of *Chytroma cistella,* from a specimen in the Kew Museum, shown partly in longitudinal section.

Fig. 7. The same, seen from above, after the removal of the operculum, showing it to be 4-celled.

Fig. 8. The pyxidium of *Chytroma amara,* copied from Aublet's drawing, restored to its natural size, as stated in the text, partly in longitudinal section.

Fig. 9. The same, seen from above, with the operculum removed, showing it to be 4-celled.

Fig. 10. The pyxidium of *Chytroma monosperma,* copied from Berg's drawing, shown partly in longitudinal section.

Fig. 11. Its single seed, the rest being abortive.

Fig. 12. The pyxidium of *Chytroma pilacarpa,* partly in longitudinal section.

Fig. 13. The pyxidium of *Chytroma basilaris,* from a specimen in the Kew Museum, shown partly in longitudinal section.

Fig. 14. The same with the operculum removed, as seen from above, showing it to be 4-celled : *all nat. size.*

Plate LIX.

Fig. 1. The pyxidium of *Chytroma grandifolia,* copied from Berg's drawing, and partly in longitudinal section.

Fig. 2. One of its seeds.

Fig. 3. The pyxidium of *Chytroma Spruceana,* from a specimen in the Kew Museum, shown partly in longitudinal section.

Fig. 4. The operculum of the same, seen from below, showing the dissepiments of its four cells.

Fig. 5. The pyxidium of *Chytroma urceolata,* from a specimen in the Kew Museum, shown partly in longitudinal section.

Fig. 6. One of its seeds.

Fig. 7. The pyxidium of *Chytroma cincturata,* from three specimens in the Kew Museum, shown partly in longitudinal section.

Fig. 8. One of its seeds.

Fig. 9. The pyxidium of *Chytroma turbinata,* from a specimen in the Kew Museum, shown partly in longitudinal section.

Fig. 10. The operculum of the same, removed, to show the four seeds embraced by its velarium.

Fig. 11. The pyxidium of the same species in an abnormal state, rendered gibbous by the abortion of three of its cells, in longitudinal section, showing the solitary seed perfected. This is from a specimen in the Kew Museum, and from another in my own collection.

Fig. 12. The operculum of the same, removed.
Fig. 13. One of its seeds.
Fig. 14. The pyxidium of *Chytroma Ibiribá*, from a specimen in the Kew Museum.
Fig. 15. Another specimen of the same, less matured, where the operculum is somewhat umbonated, shown partly in longitudinal section.
Fig. 16. One of its seeds.
Fig. 17. The pyxidium of *Chytroma Idatimon*, copied from Aublet's drawing, shown partly in longitudinal section.
Fig. 18. The operculum of the same, removed, showing the 4 seeds partly embraced by its 4 dissepiments.
Fig. 19. The pyxidium of the same with its operculum removed, seen from above, showing its 4 cells: *all nat. size.*
Fig. 20. The pyxidium of *Eschweilera angustifolia*, copied from Berg's drawing.
Fig. 21. The pyxidium of *Eschweilera compressa*, from several specimens in my own collection.
Fig. 22. The same with the operculum removed, showing, from the vestiges of the evanescent dissepiment, that it was originally 2-celled; the cicatrices of the hilar attachment of the seeds are seen in the base.
Fig. 23. One of its erect seeds, shown on its dorsal face.
Fig. 24. The same, viewed from below, showing the position of the hilum at the bottom of the basal angle: *all nat. size.*

Plate LX.

Fig. 1. The pyxidium of *Eschweilera rigida*, from a specimen in the Kew Museum, shown partly in longitudinal section.
Fig. 2. One of its seeds, seen on its ventral face.
Fig. 3. The same, on its dorsal side.
Fig. 4. The pyxidium of *Eschweilera serrulata*, from a specimen in the Kew Museum, shown partly in longitudinal section.
Fig. 5. One of its seeds.
Fig. 6. The pyxidium of *Eschweilera Fendleri*, from a specimen in the Kew Museum, shown partly in longitudinal section.
Fig. 7. The pyxidium of *Eschweilera Guanabarica*, from several specimens in my own collection, shown partly in longitudinal section; in some of them the umbonate prominence of the operculum almost disappears, leaving the summit quite flattened.
Fig. 8. One of its seeds.
Fig. 9. The pyxidium of *Eschweilera Idatimonoides*, copied from Berg's drawing, shown in longitudinal section.
Fig. 10. The pyxidium of *Eschweilera corrugata*, from a specimen in the Kew Museum, from Demerara, shown partly in longitudinal section.
Fig. 11. The same, copied from Poiteau's drawing.
Fig. 12. The pyxidium of *Eschweilera longipes*, copied from Poiteau's drawing, shown partly in longitudinal section.
Fig. 13. The same with the operculum removed, to show it is originally 2-celled, the dissepiment becoming withered.
Fig. 14. The pyxidium of *Eschweilera Blanchetiana*, drawn from Berg's description.
Fig. 15. The pyxidium of *Eschweilera lævifolia*, from a specimen in the Kew Museum.
Fig. 16. The pyxidium of *Eschweilera ovata*, from a specimen in the Kew Museum sent by Gardner from Pernambuco, partly in longitudinal section.
Fig. 17. The pyxidium of *Eschweilera Luschnatii*, from Burchell's specimen in the Kew Museum.

Fig. 18. The pyxidium of *Eschweilera platycarpa*, copied from Poiteau's drawing, partly in longitudinal section.

Fig. 19. The pyxidium of *Eschweilera parviflora*, copied from Aublet's drawing, shown partly in longitudinal section.

Fig. 20. One of its seeds.

Fig. 21. The pyxidium of *Eschweilera parvifolia*, from Dr. Berg's description.

Fig. 22. The pyxidium of *Eschweilera Siberiana*, from Dr. Berg's description, shown partly in longitudinal section.

Fig. 23. The pyxidium of *Eschweilera lurida*, from Burchell's specimen in the Kew Museum: *all nat. size*.

Plate LXI.

Fig. 1. The pyxidium of *Jugastrum coriaceum*, copied from Dr. Berg's drawing, and shown partly in longitudinal section.

Fig. 2. The same with the operculum removed, seen from above, showing the seeds in one of its two cells, the seeds being removed from the other that the cicatrices may be seen in the base, to denote the points of attachment of the erect seeds.

Fig. 3. One of its seeds.

Fig. 4. The pyxidium of *Jugastrum subcinctum*, from specimens in the Kew Museum, shown partly in longitudinal section.

Fig. 5. The same, from another specimen in the same Museum.

Fig. 6. One of its seeds.

Fig. 7. The pyxidium of *Jugastrum obtectum*, from a specimen in the Kew Museum.

Fig. 8. One of its seeds.

Fig. 9. The pyxidium of *Jugastrum platyspermum*, from a specimen in the Kew Museum.

Fig. 10. One of its seeds, shown on its ventral face.

Fig. 11. The same, seen on its edge.

Fig. 12. Another pyxidium of the same, from a specimen in the British Museum.

Fig. 13. The pyxidium of *Jugastrum depressum*, from a specimen in the Kew Museum.

Fig. 14. Another specimen of the same, in the British Museum.

Fig. 15. One of its seeds: *all nat. size.*

Plate LXII.

Fig. 1. The pyxidium of *Couratari Martiana*, from a specimen in the British Museum, shown partly in longitudinal section.

Fig. 2. The operculum and its columella, removed, much contracted in drying.

Fig. 3. One of its seeds, shown on its face.

Fig. 4. The same, seen on its edge.

Fig. 5. The pyxidium of *Couratari glabra*, copied from Berg's drawing, shown partly in longitudinal section.

Fig. 6. Its operculum and columella, contracted in drying.

Fig. 7. One of its seeds.

Fig. 8. The pyxidium of *Couratari rufescens*, from three specimens in my own collection, shown partly in longitudinal section.

Fig. 9. Its operculum and columella, contracted in drying.

Fig. 10. A transverse section of the same when in the fresh state, showing the 3 cells formed round the columella.

Fig. 11. One of its seeds, seen on its face.

Fig. 12. The same, seen on its edge.

Fig. 13. The pyxidium of *Couratari Guianensis*, from specimens in my own and other collections, shown partly in longitudinal section.
Fig. 14. The operculum and columella of the same, shrunk in drying.
Fig. 15. A transverse section of the same when in the fresh state, showing the 3 cells round the columella.
Fig. 16. One of its seeds: *all nat. size.*

Plate LXIII.

Fig. 1. The pyxidium of *Cariniana Brasiliensis*, from several specimens in my own collection, shown partly in longitudinal section.
Fig. 2. The operculum and columella, removed.
Fig. 3. Two of its seeds.
Fig. 4. The pyxidium of *Cariniana domestica*, copied from Berg's drawing, shown partly in longitudinal section.
Fig. 5. The operculum and columella of the same.
Fig. 6. The pyxidium of *Cariniana excelsa*, from a specimen in the Kew Museum, shown partly in longitudinal section, and where the teeth are seen in its mouth.
Fig. 7. The operculum and columella of the same, contracted in drying.
Fig. 8. The seeds of the same, in different positions.
Fig. 9. The pyxidium of *Cariniana Uahupensis*, shown partly in longitudinal section.
Fig. 10. The pyxidium of *Cariniana rubra*, from a specimen in the Kew Museum, shown partly in longitudinal section.
Fig. 11. The pyxidium of *Cariniana pyriformis*, from a specimen in the collection of the Linnean Society and three others in the Kew Museum, shown partly in longitudinal section.
Fig. 12. The operculum and columella of the same, showing the impressions left by its imbricated seeds.
Fig. 13. The seeds, seen in front and on the edge: *all nat. size.*

Plate LXIV.

Fig. 1. The pyxidium of *Allantoma torulosa*, from a specimen in the British Museum. There is another, somewhat smaller, in the Kew Museum; it is shown partly in longitudinal section.
Fig. 2. A transverse section of the same when in its fresh state, showing the 5 cells round the columella.
Fig. 3. One of its seeds.
Fig. 4. The pyxidium of *Allantoma cylindrica*, from a specimen in the Kew Museum and another in my own collection, shown partly in longitudinal section.
Fig. 5. A transverse section of the same when in a fresh state, showing its 4 cells round the columella.
Fig. 6. One of its seeds, seen in front.
Fig. 7. The same, shown on its edge.
Fig. 8. The same, seen on its dorsal face, showing the hilum on one of the basal lobes.
Fig. 9. The pyxidium of *Allantoma macrocarpa*, from a specimen in the Kew Museum, which agrees with the drawing of Berg: it is shown partly in longitudinal section.
Fig. 10. The pyxidium of *Allantoma dictyocarpa*, copied from Berg's drawing: *all nat. size.*

Plate LXV.

Fig. 1. The pyxidium of *Allantoma scutellata*, from a specimen in the Museum of the Linnean Society, shown partly in a longitudinal section, with its columella much shrunk in drying.
Fig. 2. A transverse section of the same when in a fresh state, showing the 4 cells round the columella.
Fig. 3. One of its seeds.

Fig. 4. The pyxidium of *Allantoma lineata*, copied from Berg's drawing.
Fig. 5. A transverse section of the same when in its fresh state, showing the 5 cells round the columella.
Fig. 6. The pyxidium of *Allantoma Burchelliana*, from a specimen in the Kew Museum, shown partly in longitudinal section.
Fig. 7. A transverse section of the same when in a fresh state, showing its 4 cells round the columella.
Fig. 8. One of its seeds.
Fig. 9. The pyxidium of *Allantoma aulacocarpa*, from Berg's drawing, shown partly in longitudinal section.
Fig. 10. The pyxidium of *Allantoma corbula*, from a specimen in the British Museum, and shown in partly longitudinal section.
Fig. 11. A transverse section of the same when in a fresh state, showing the 5 cells round the columella: *all nat. size*.

POSTSCRIPT.

After the above memoir was in type, I received from my friend Sen^r^ Mattos entire specimens of ripe fruits of *Lecythis* preserved in spirits, which serve to throw additional light upon the carpological structure of that genus. The specimens of *L. Coxiana*, alluded to in p. 218, were mere portions of a pyxidium, intended to show the existence of the large funicle attached to each seed: but they were insufficient to enable me to determine whether the attachment was at the base or near the summit of the columella; and in deciding between these alternatives the wrong inference was drawn. As the fruit, from its great weight, always hangs in an inverted position, the seeds in a longitudinal section of the specimen appear, as in their natural growth, suspended; but when the fruit is placed in an erect posture, the seeds then stand upon their large funicles, which are attached to the base of the columella, as they are correctly shown in Plate LVI. In consequence of this explanation the following corrections are needed :—

ERRATA.

Page 163, 11 lines from bottom, *for* suspension *read* attachment
„ 166, 2 lines from bottom, *for* suspended *read* supported
„ 167, line 2, *for* suspended *read* supported
„ 192, *erase* nob. *and insert* Berg in Linn. xxxi. p. 261.
„ 200, line 17, *for* ab hilo subsupero *read* ad hilum subinferum
„ „ line 18, *for* suspensa *read* sustenta
„ 202, 11 lines from bottom, *for* suspensis *read* sustentis
„ 203, line 6, *for* suspended by *read* supported on
„ 205, under LECYTHIS LACUNOSA
erase planta ignota: *and insert* ramis griseo-brunneis, striolatis, ramulis tenuissimis; foliis ovatis vel elliptico-oblongis, imo acutis et in petiolo decurrentibus, apice in acumen angustum obtusulum repente constrictis, inæqualiter obtuse dentato-serratis, subchartaceis, supra fusco-viridibus, opacis, nervis venisque eximie reticulatis utrinque prominentibus, et in areolis griseo-pruinosis, subtus pallidioribus, opacis, costa utrinque puberula; petiolo tenui, canaliculato, reflexim marginato, subpuberulo, 14plo breviore: inflorescentia ignota:

And at the end *add* the leaves are 2–2¾ in. long, 1–1¼ in. broad, on petioles 1½–2½ lines long. A specimen of the fruit of this species in section, and another of *L. tuberculata*, both preserved in spirits, are deposited in the British Museum.

Page 216, 17 lines from bottom, *for* suspensis *read* sustentis

„ 218, line 2, *for* suspensis *read* sustentis

„ „ 3 lines from bottom, *for* suspensis *read* sustentis.

„ 219, line 13, *for* suspended *read* supported *for* lateral *read* sublateral *and dele* a little below the summit

„ „ 6 lines from bottom, *for* suspensis *read* sustentis

„ 220, 11 lines from bottom *for* suspensis *read* sustentis

„ 221, line 8, *for* suspended *read* supported

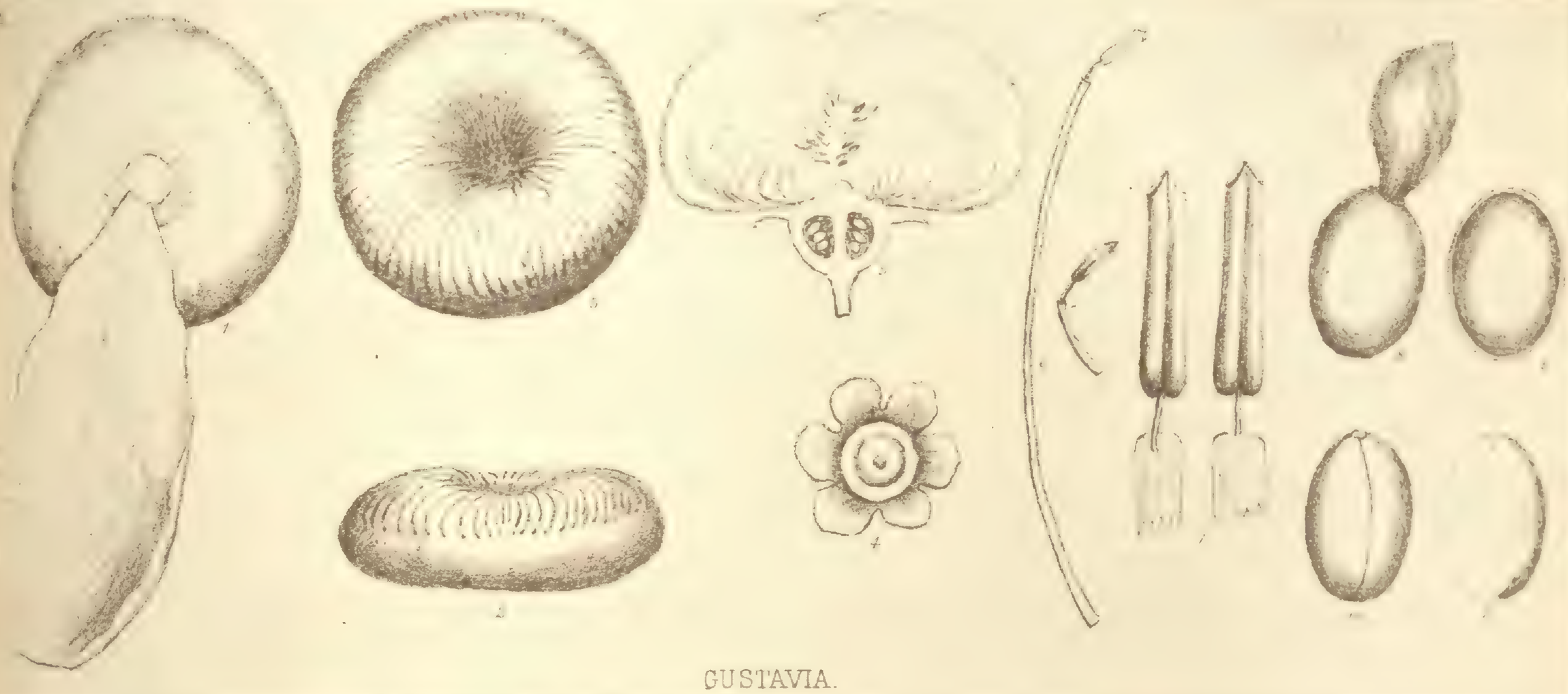
„ 304, under Plate XXXIV. fig. 13, *between* seeds *and* suspended *insert* as it appears *and for* summit *read* base

„ 310, under Plate XXXIX. fig. 2, *for* suspended by *read* attached to

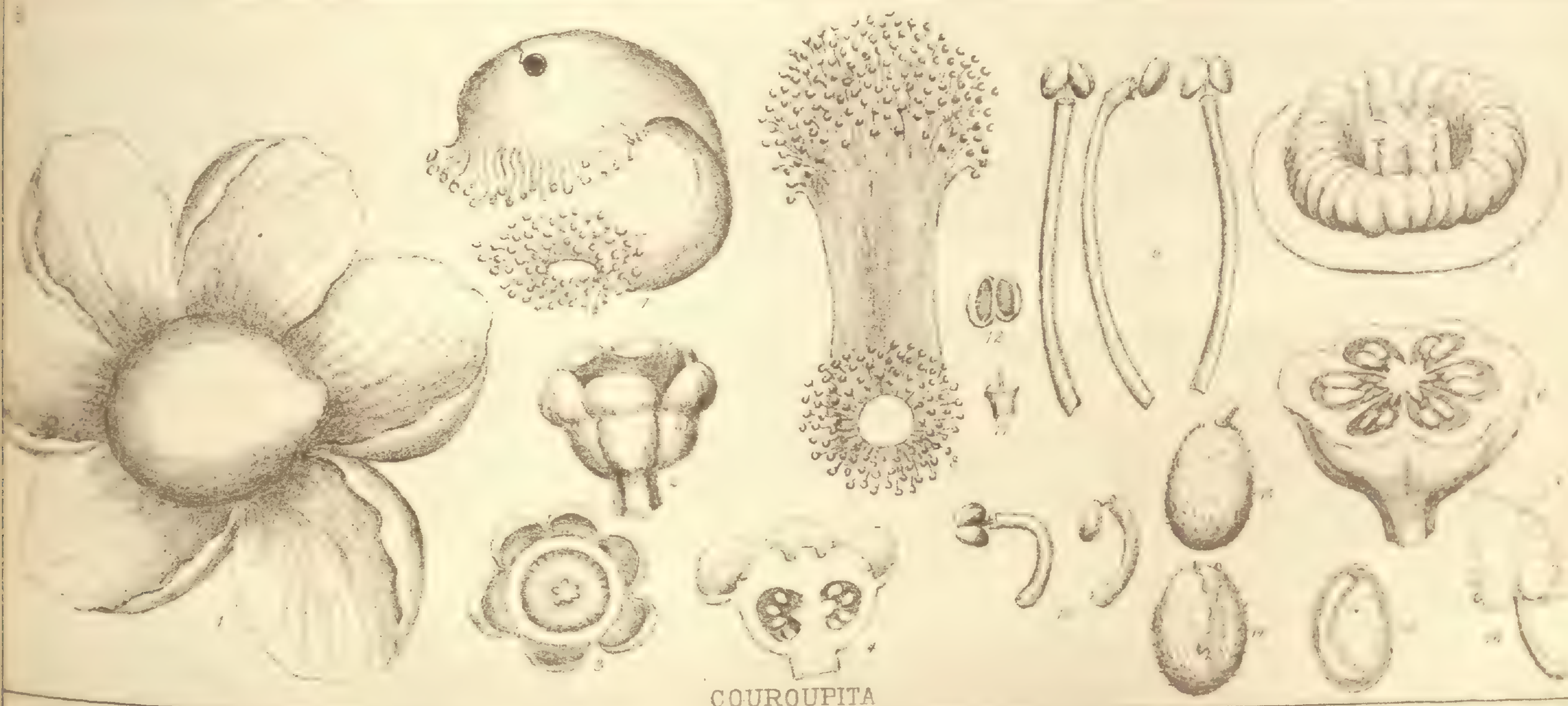
„ 312, in Plate LVI. fig. 1, *after* collection *insert* with the seeds and funicles in their true position

„ „ in fig. 3, *for* suspended by *read* supported on

„ „ in fig. 4, line 2, *for* suspended by *read* supported on



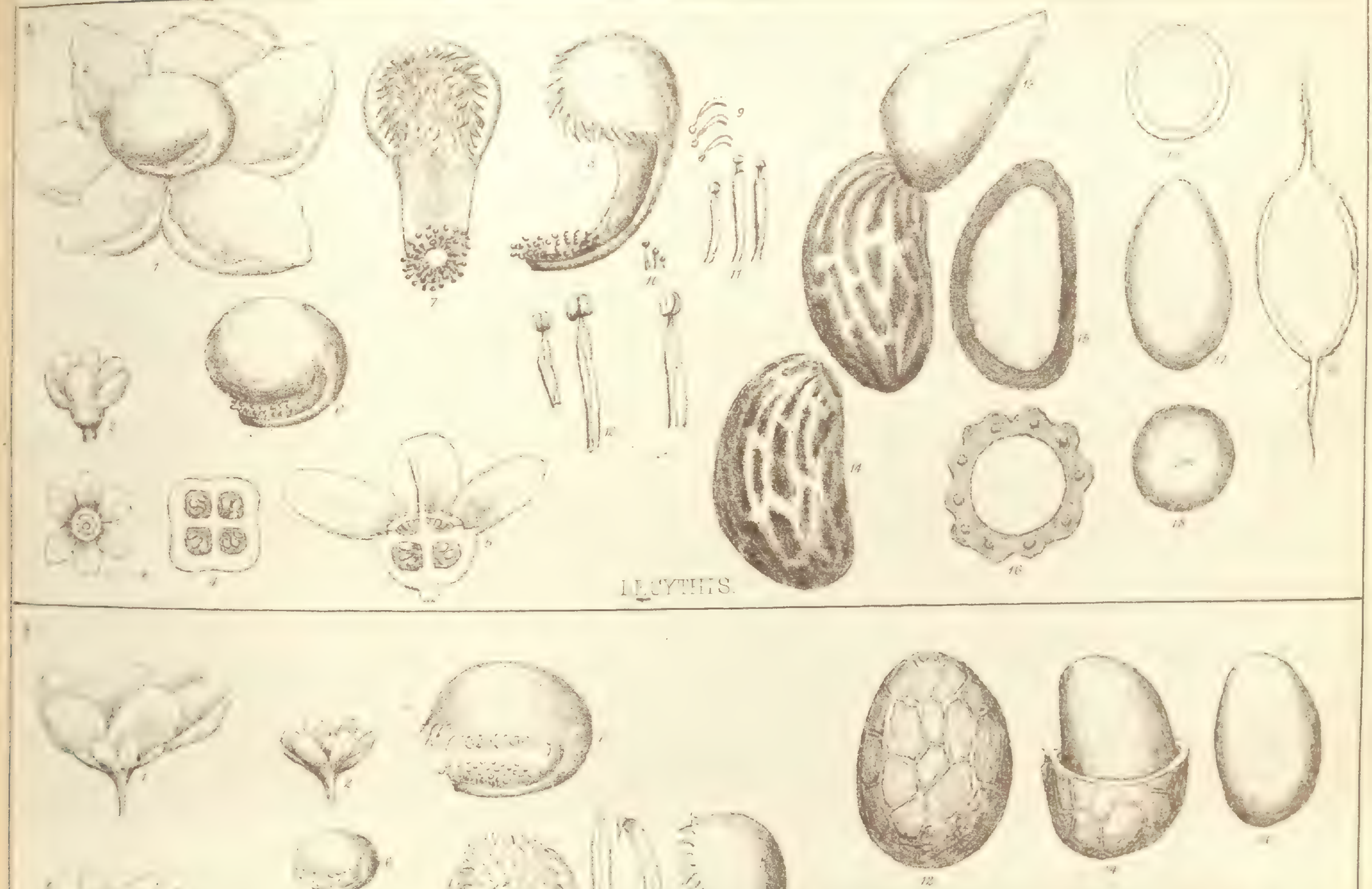
GUSTAVIA.



COUROUPITA

BERTHOLLETIA.

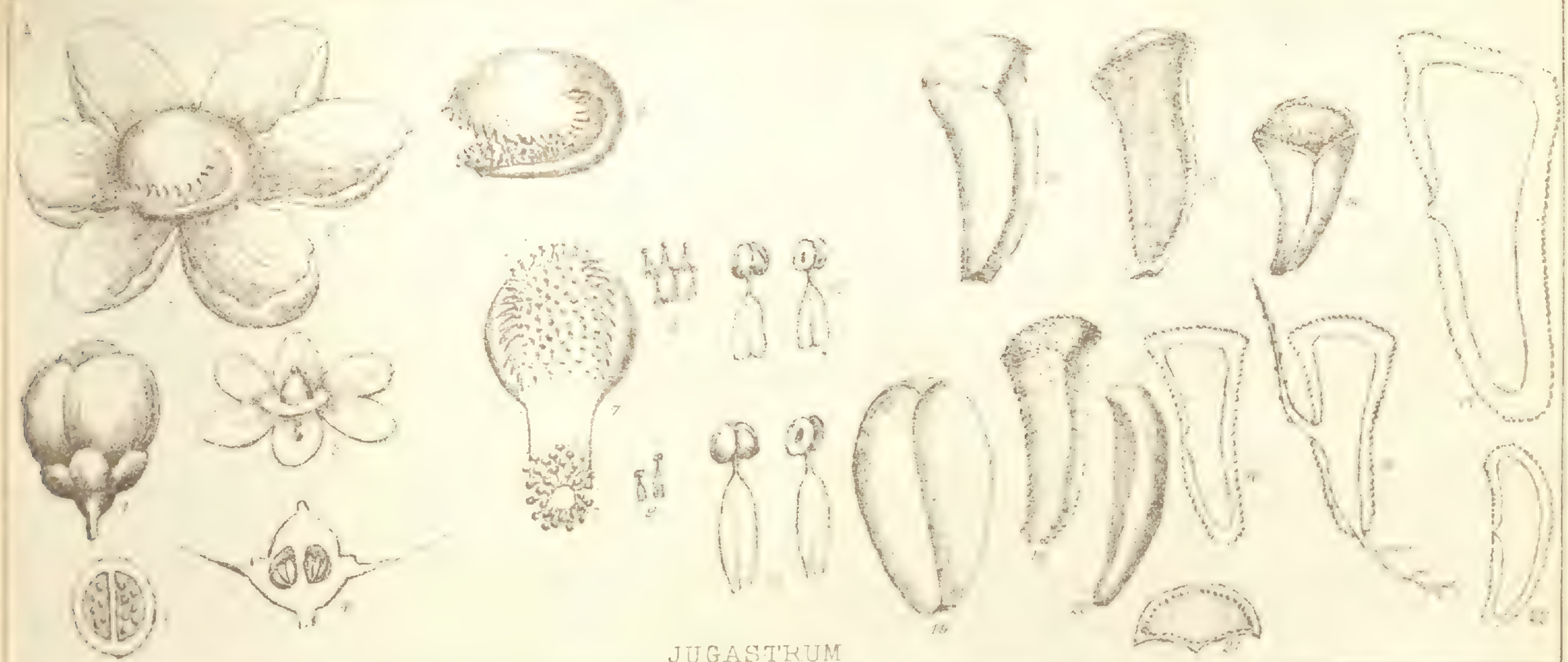
Maclure & Macdonald Lith London



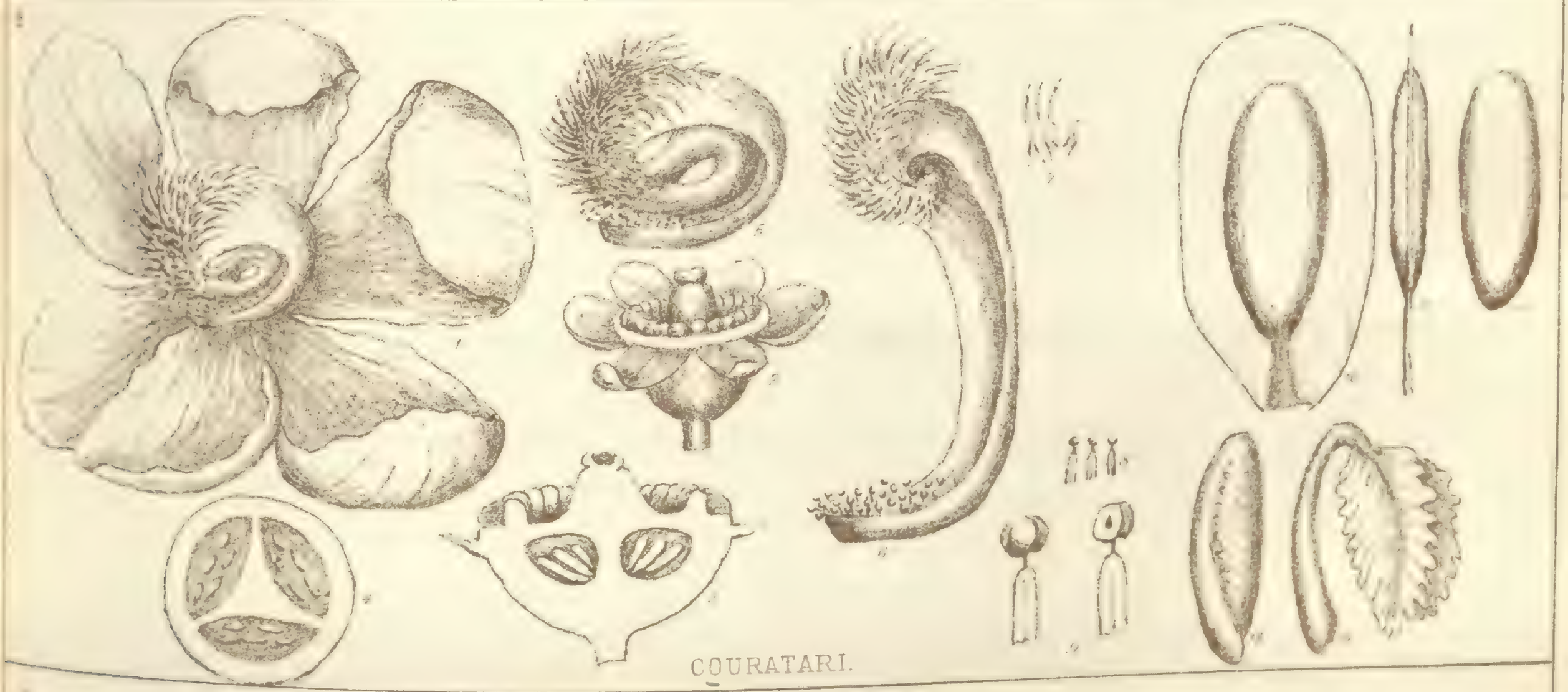
LECYTHIS.

CHYTROMA

ESCHWEILERA



JUGASTRUM

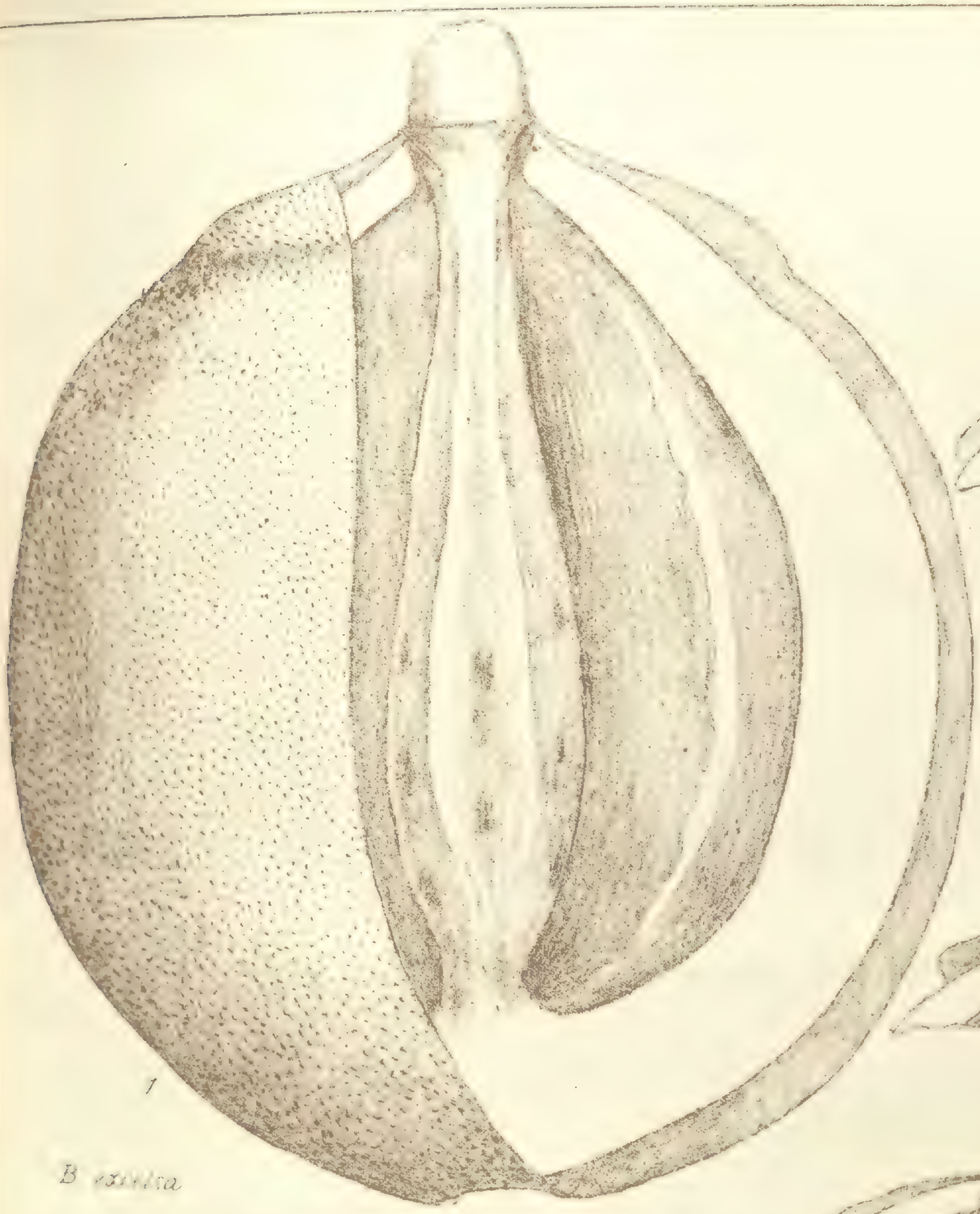


COURATARI.

CARINIANA

ALLANTOMA

CERCOPHORA.



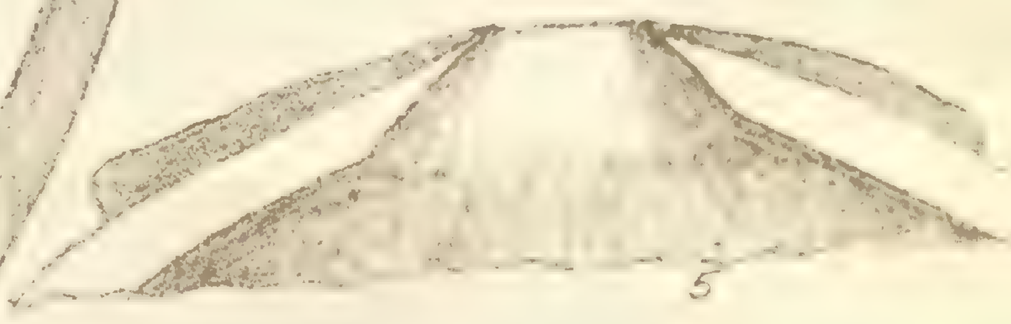
1

B. excelsa

3

2

6



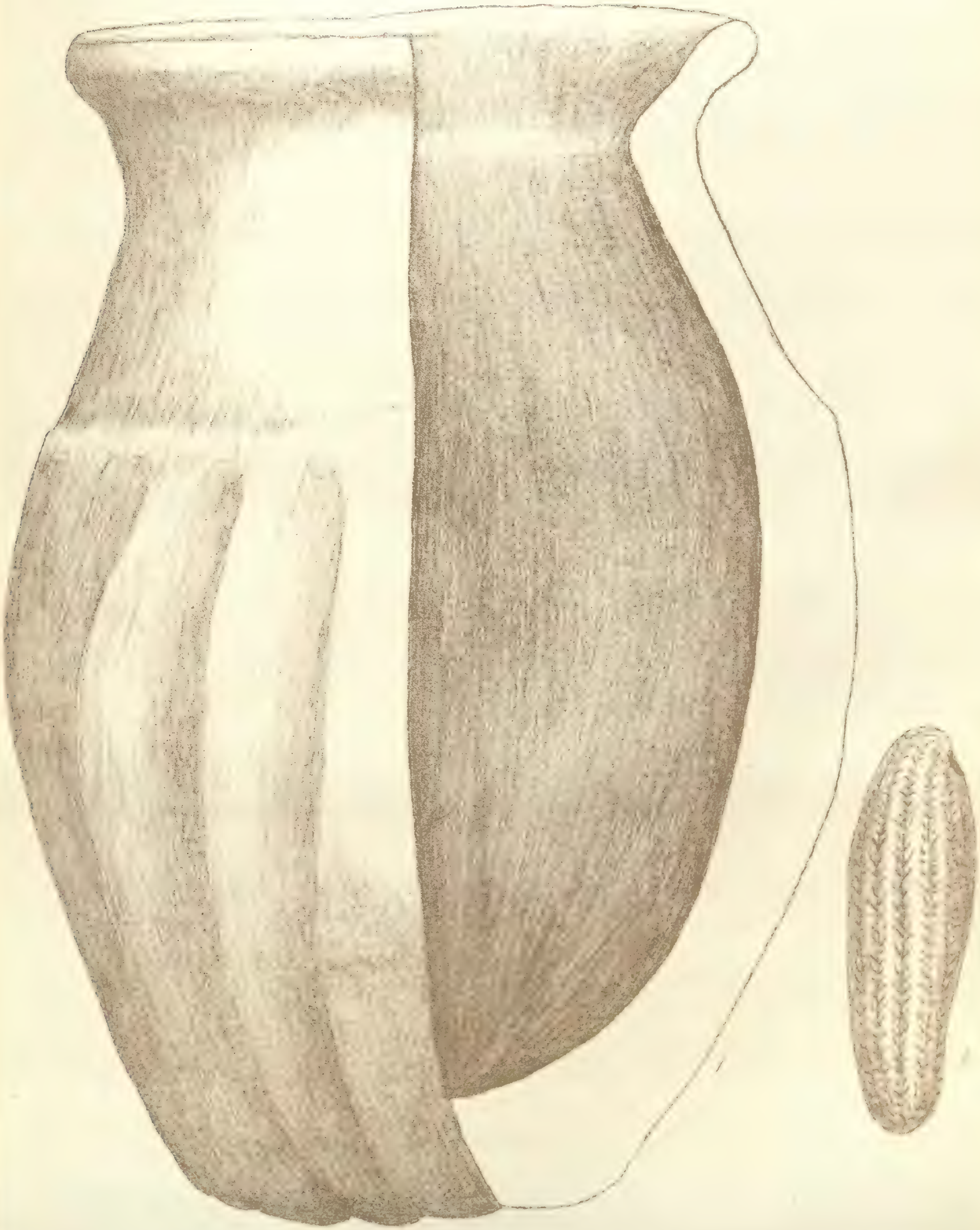
5

7

B. nobilis

4

B. excelsa



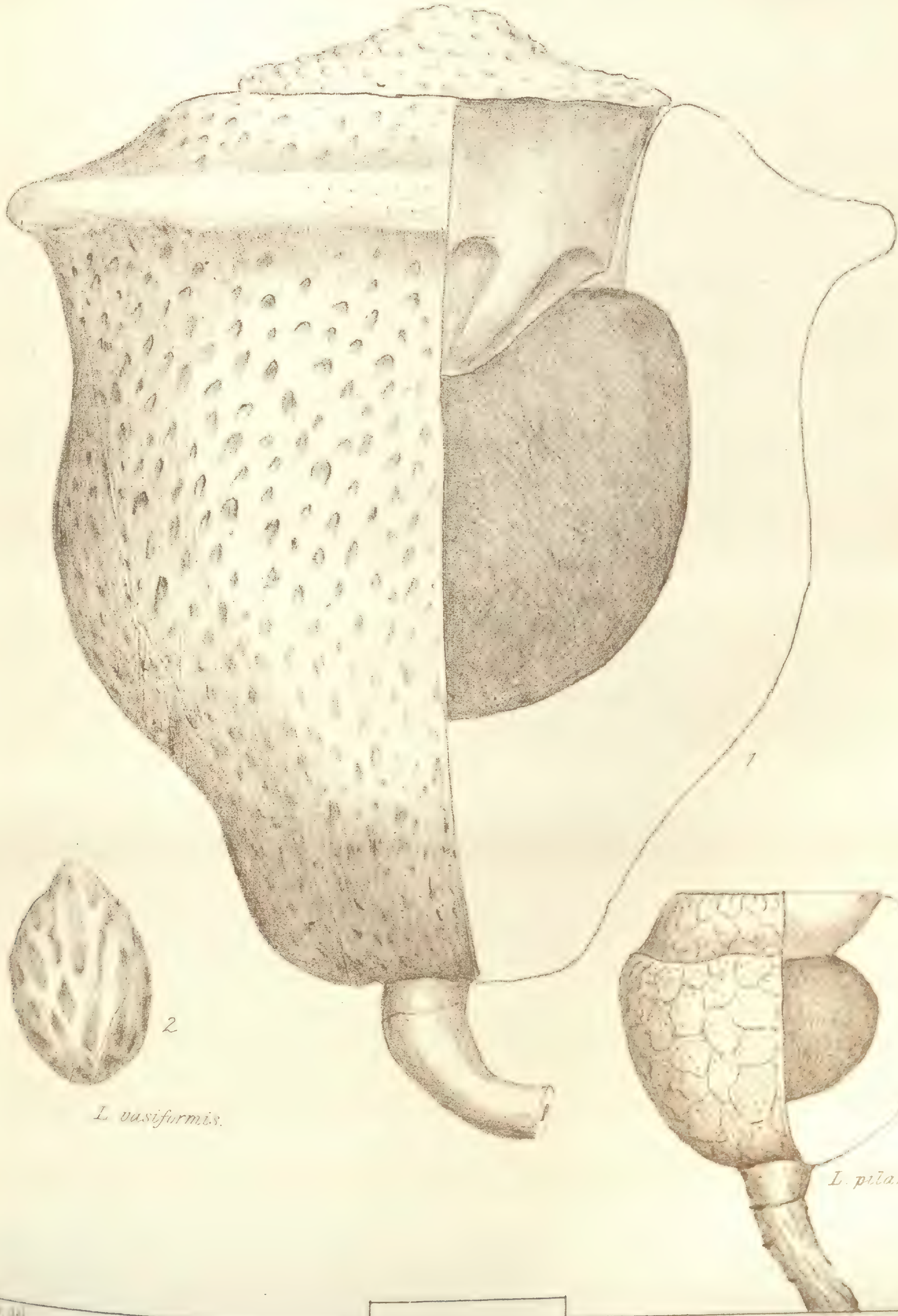
Lecythis Amplularia

LIBYTHIS URNIGERA

LECYTHIS VELLOZIALA

Maguire & Macdonald Lith. London

LECYTHIS BOGOTENSIS



LECYTHIS.

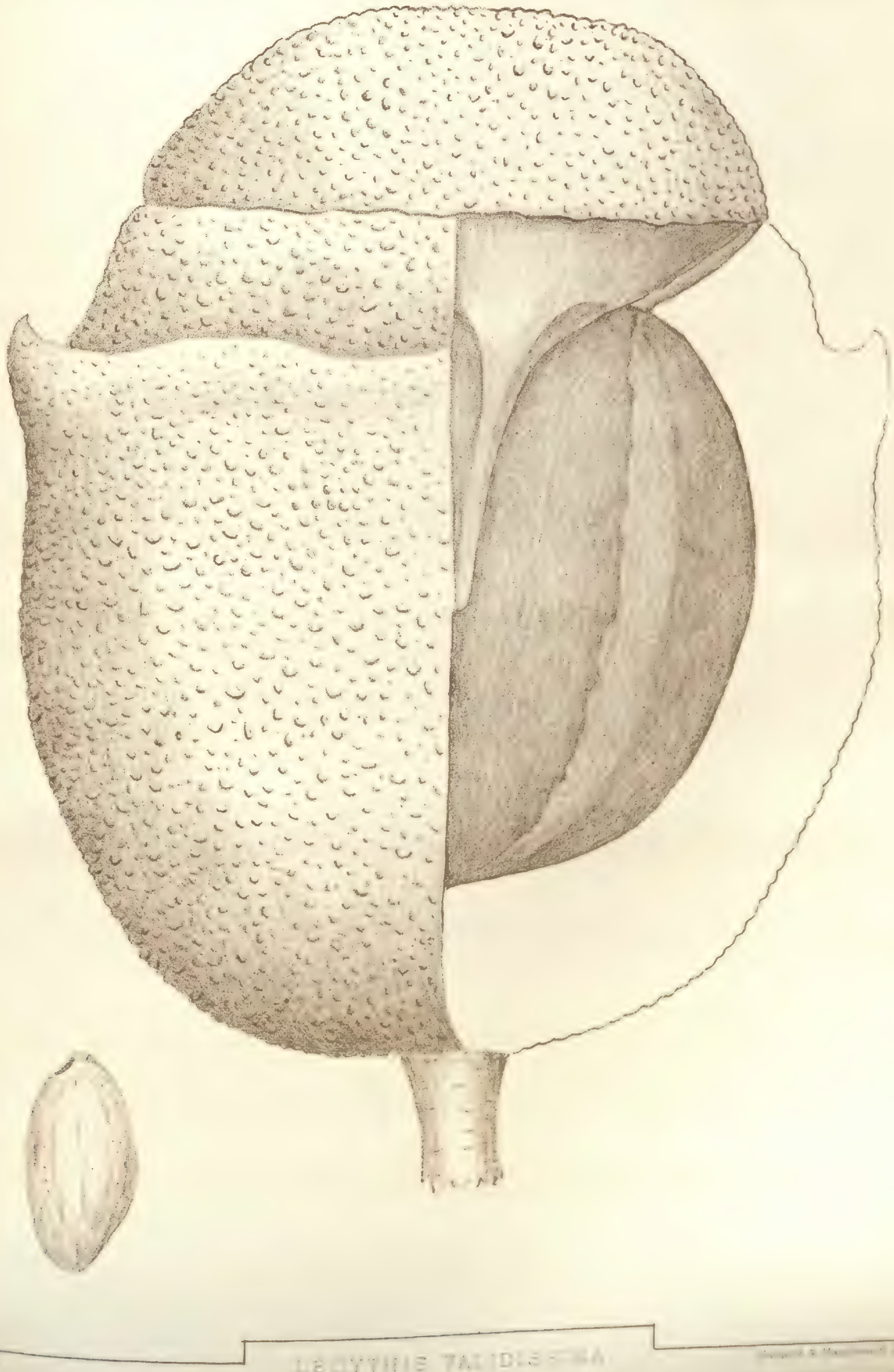
Macure & Macdonald. Lith. Lon.

1
L. ampla.

2

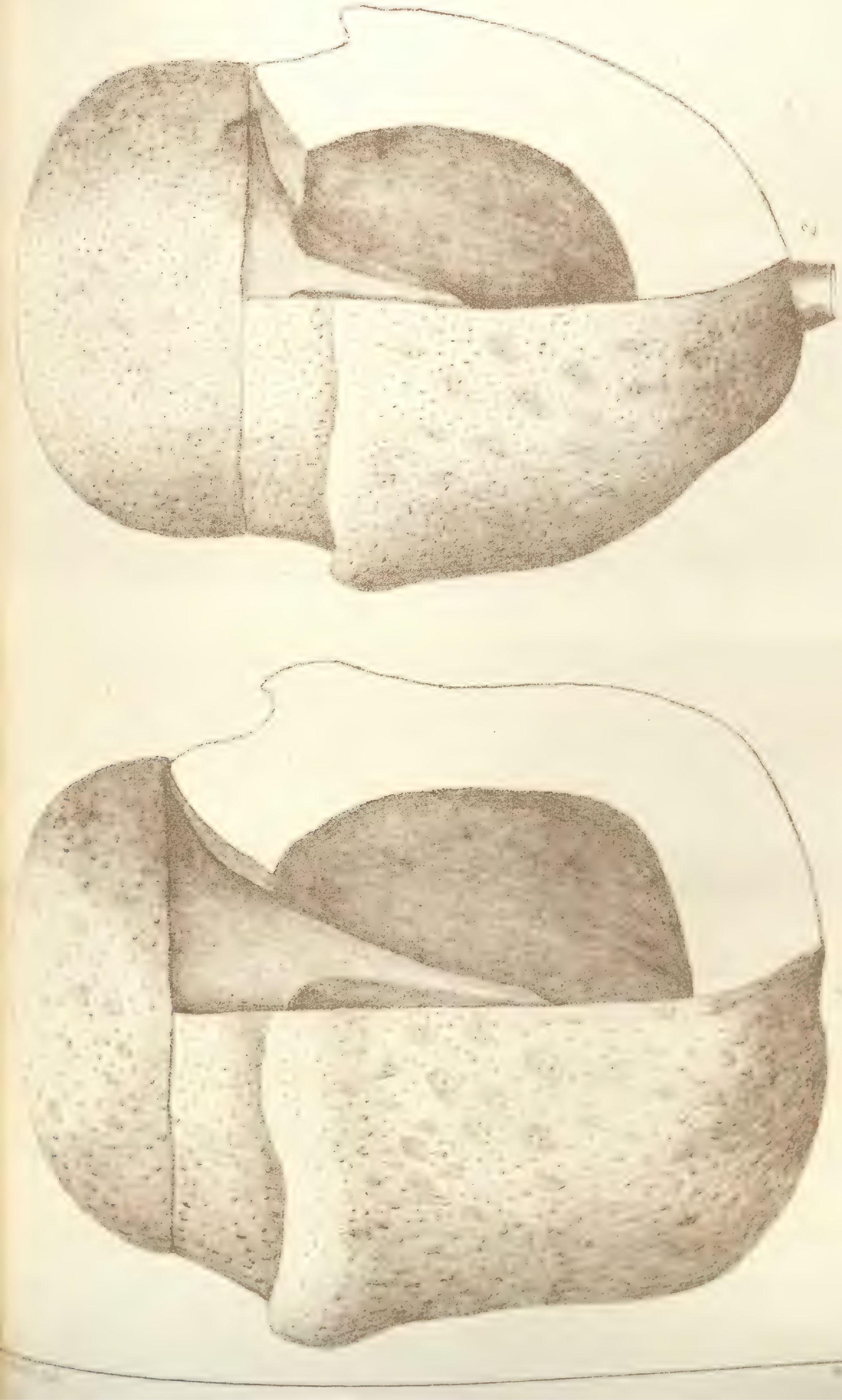
3

L. rugata

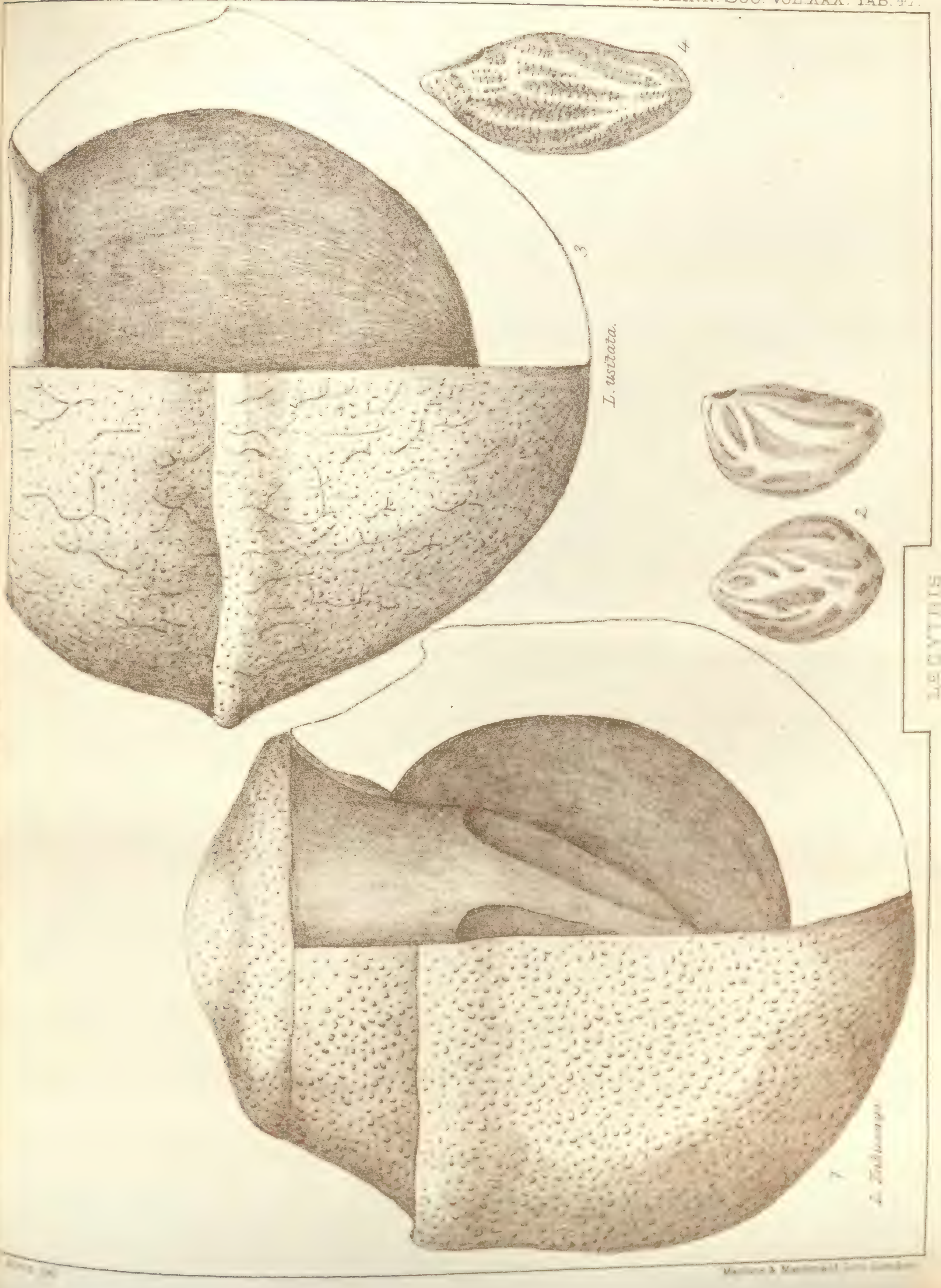


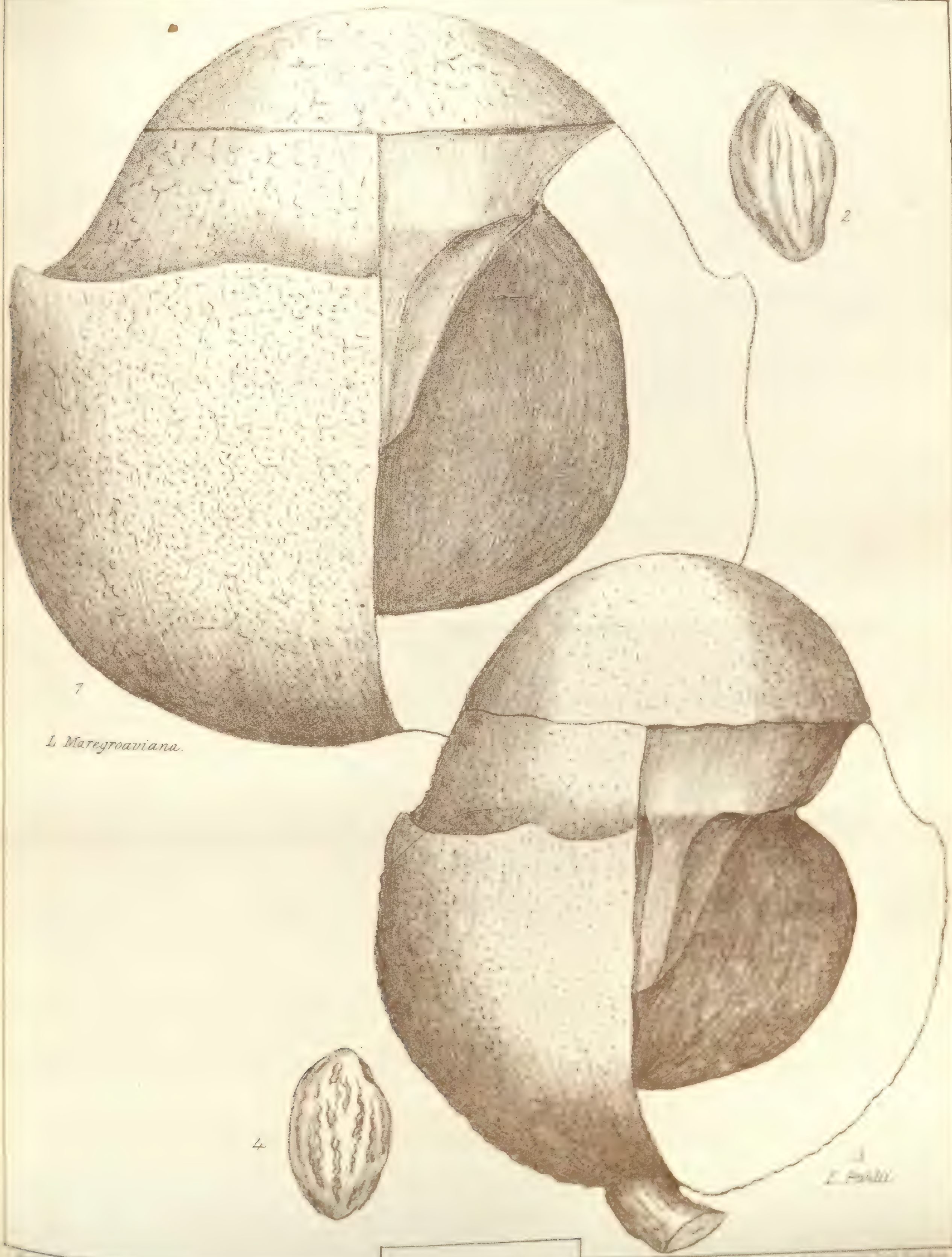
LECYTHIS LACUNOSA.

Maclure & Macdonald Lith London



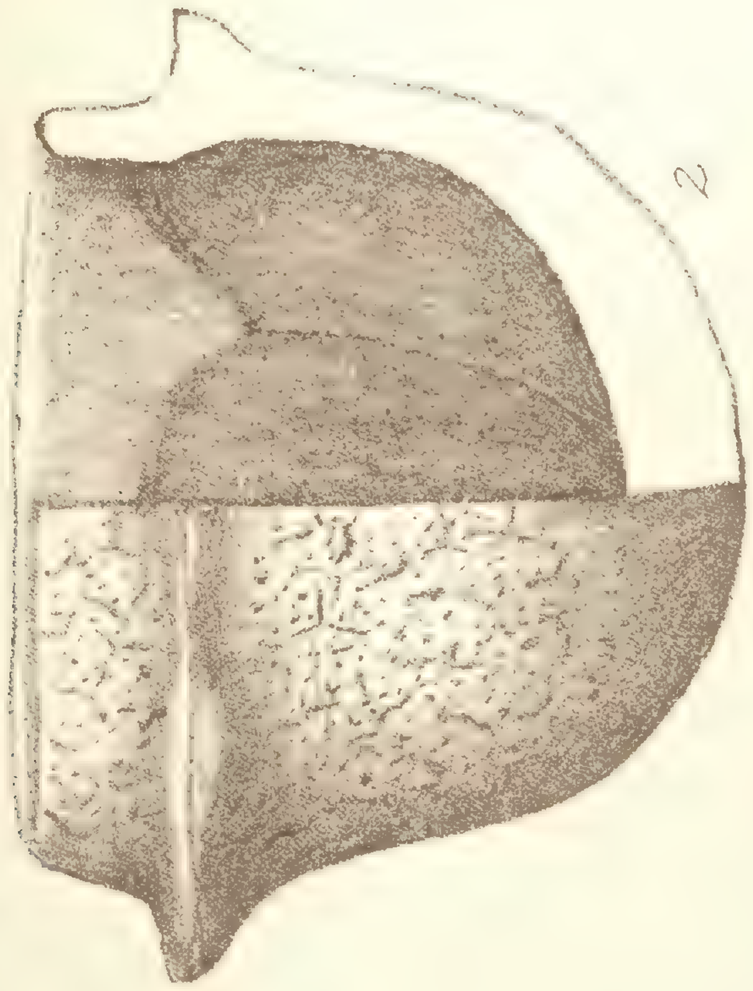
LECYTHIS LANCEOLATA.


4
3
1. usitata.
2
1

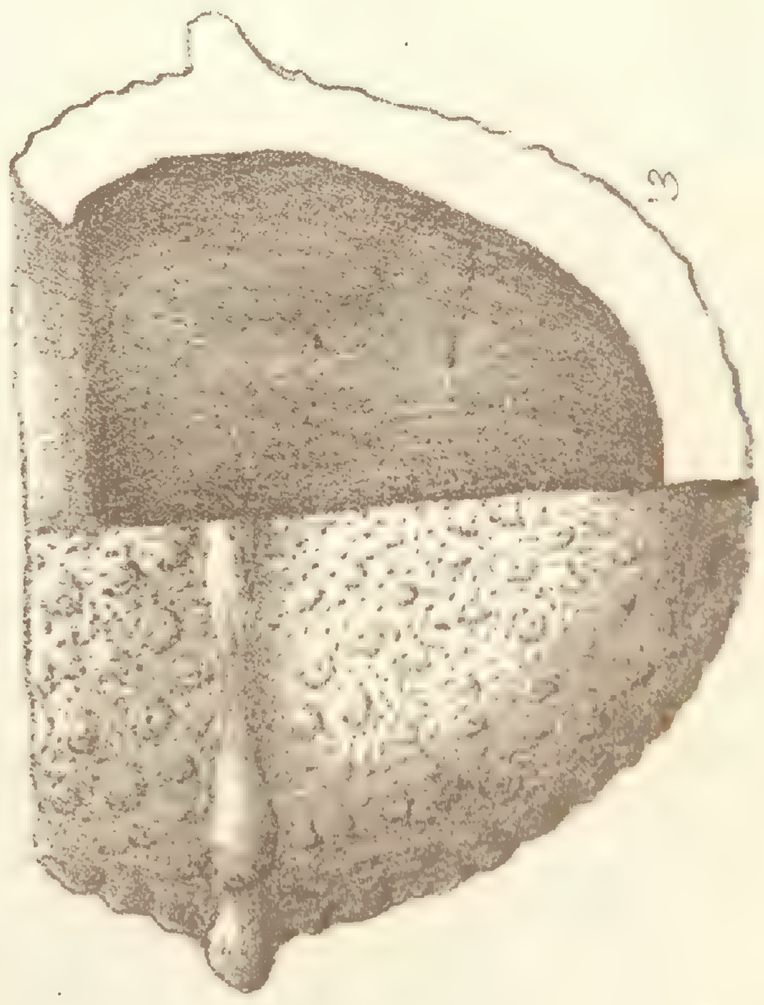


L. Maregroaviana.

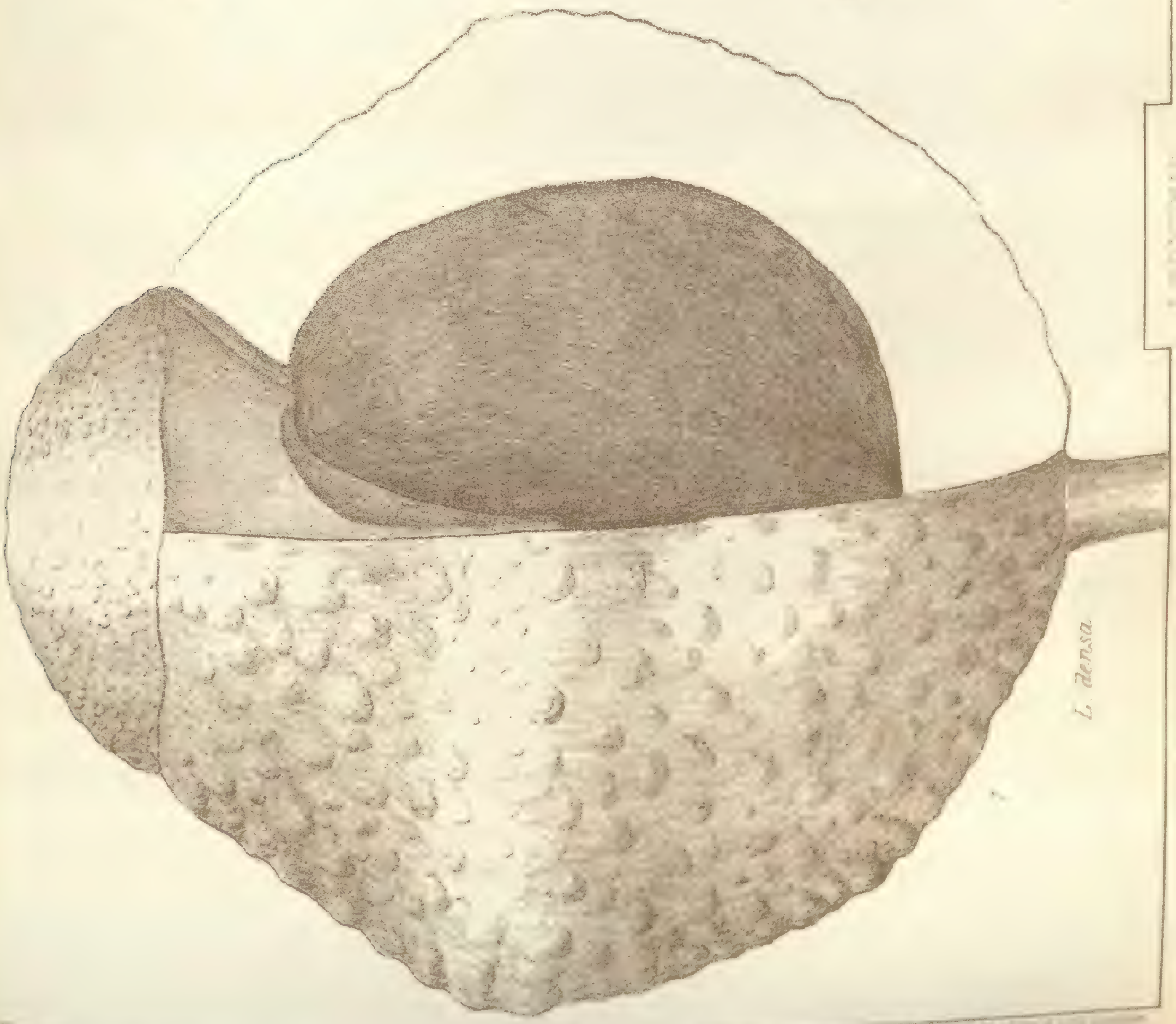
LECYTHIS.



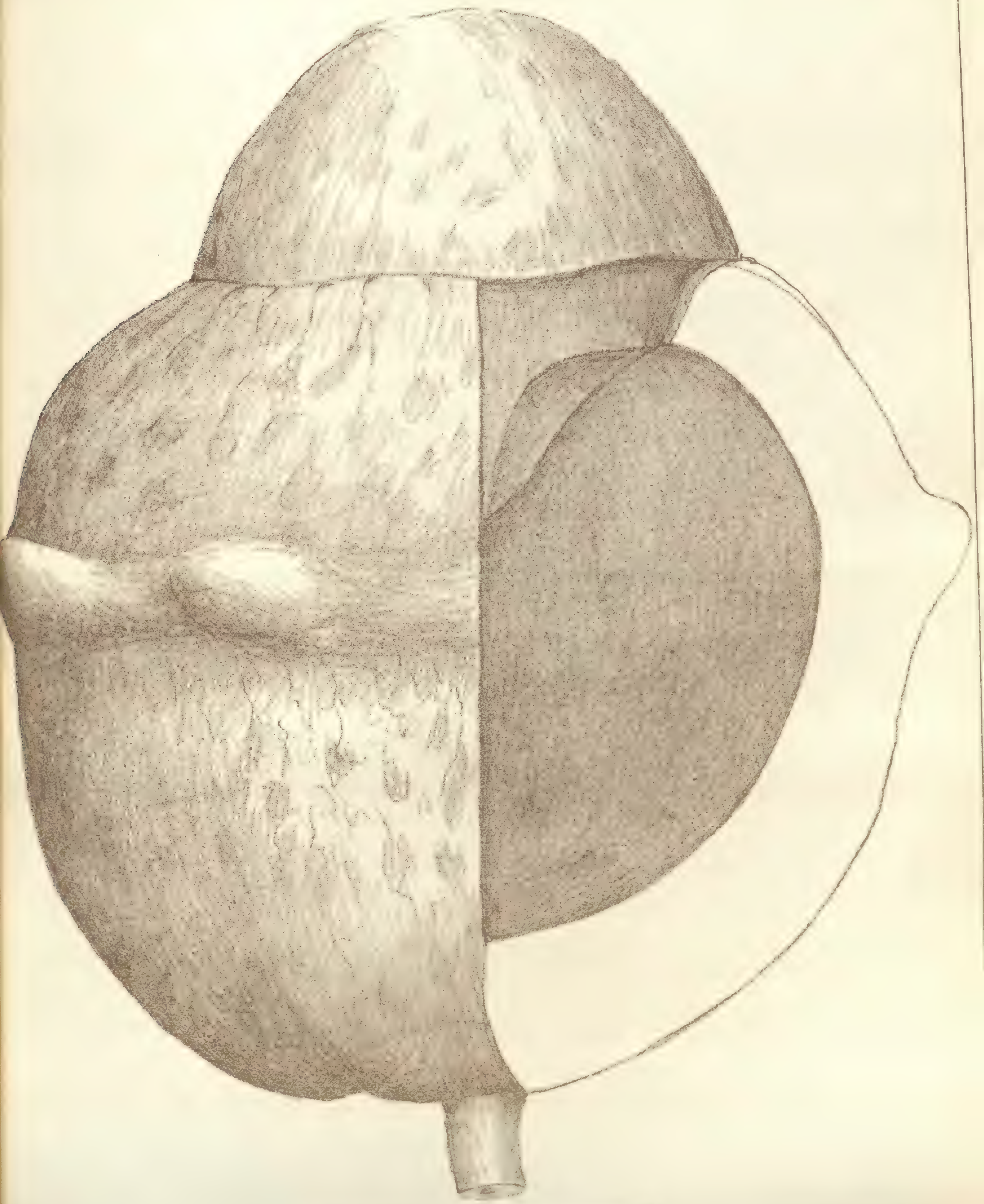
L. cupularis.



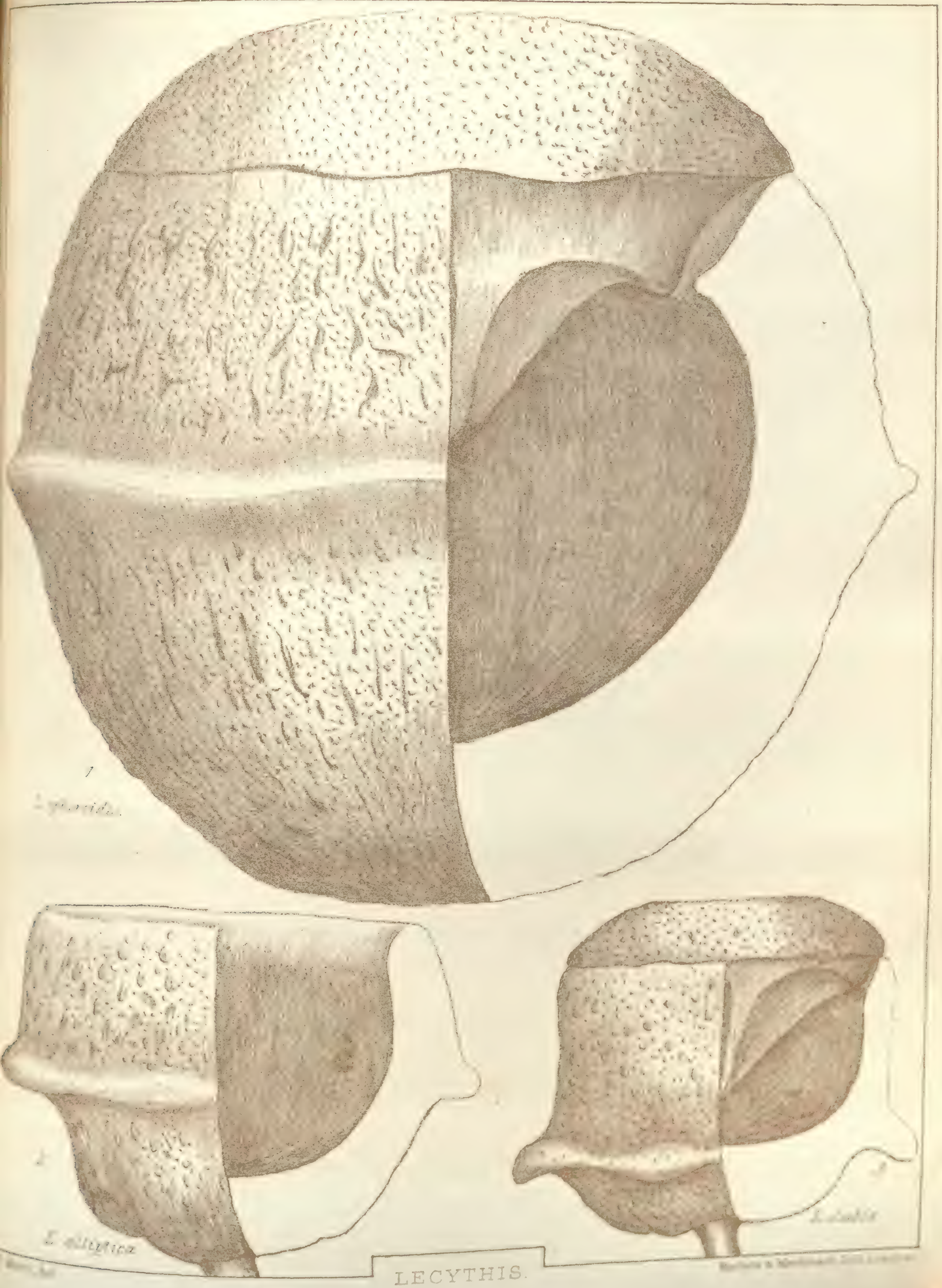
L. levigatus.



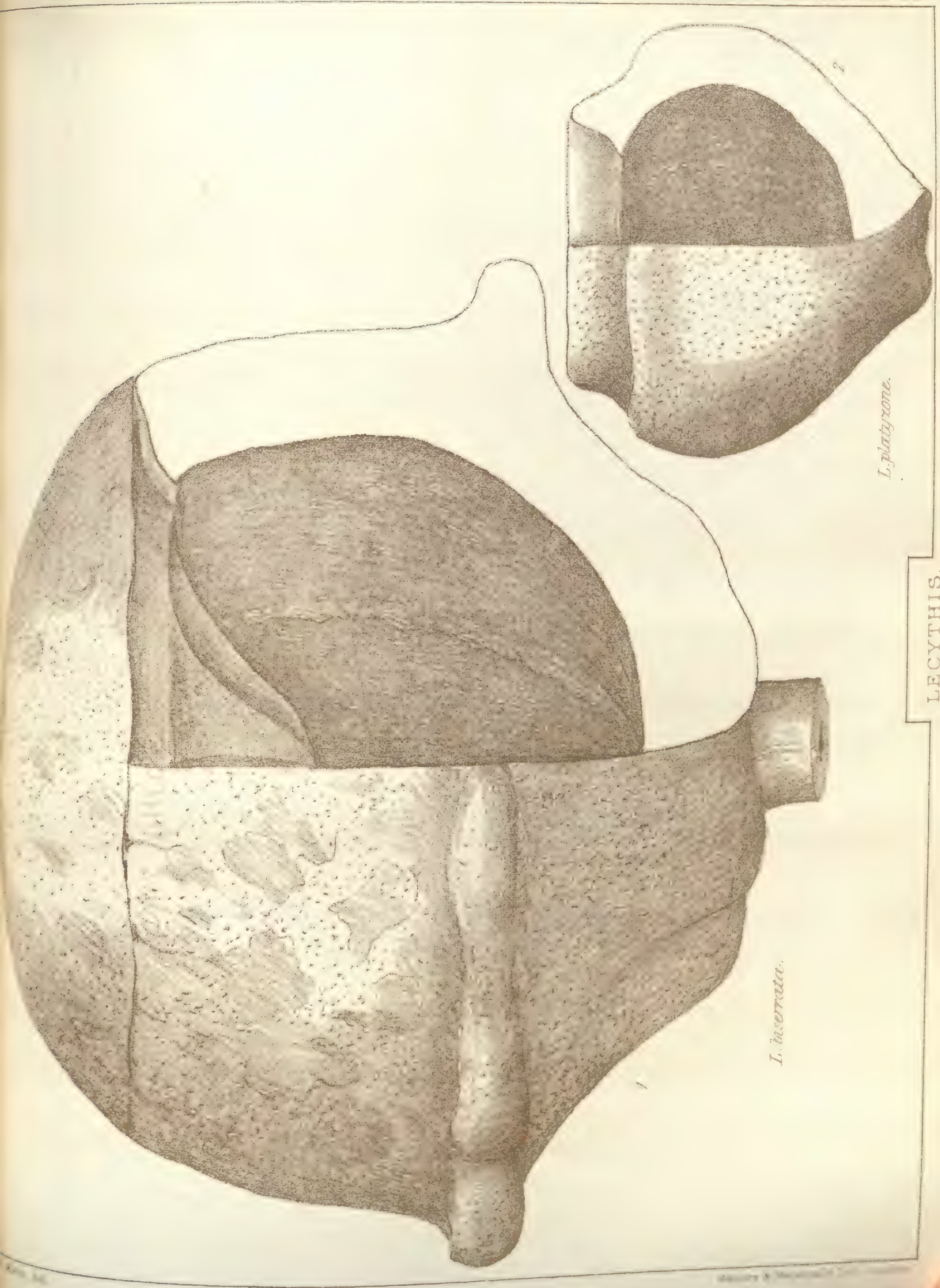
L. densa.



LECYTHIS PISONIS.



LECYTHIS.

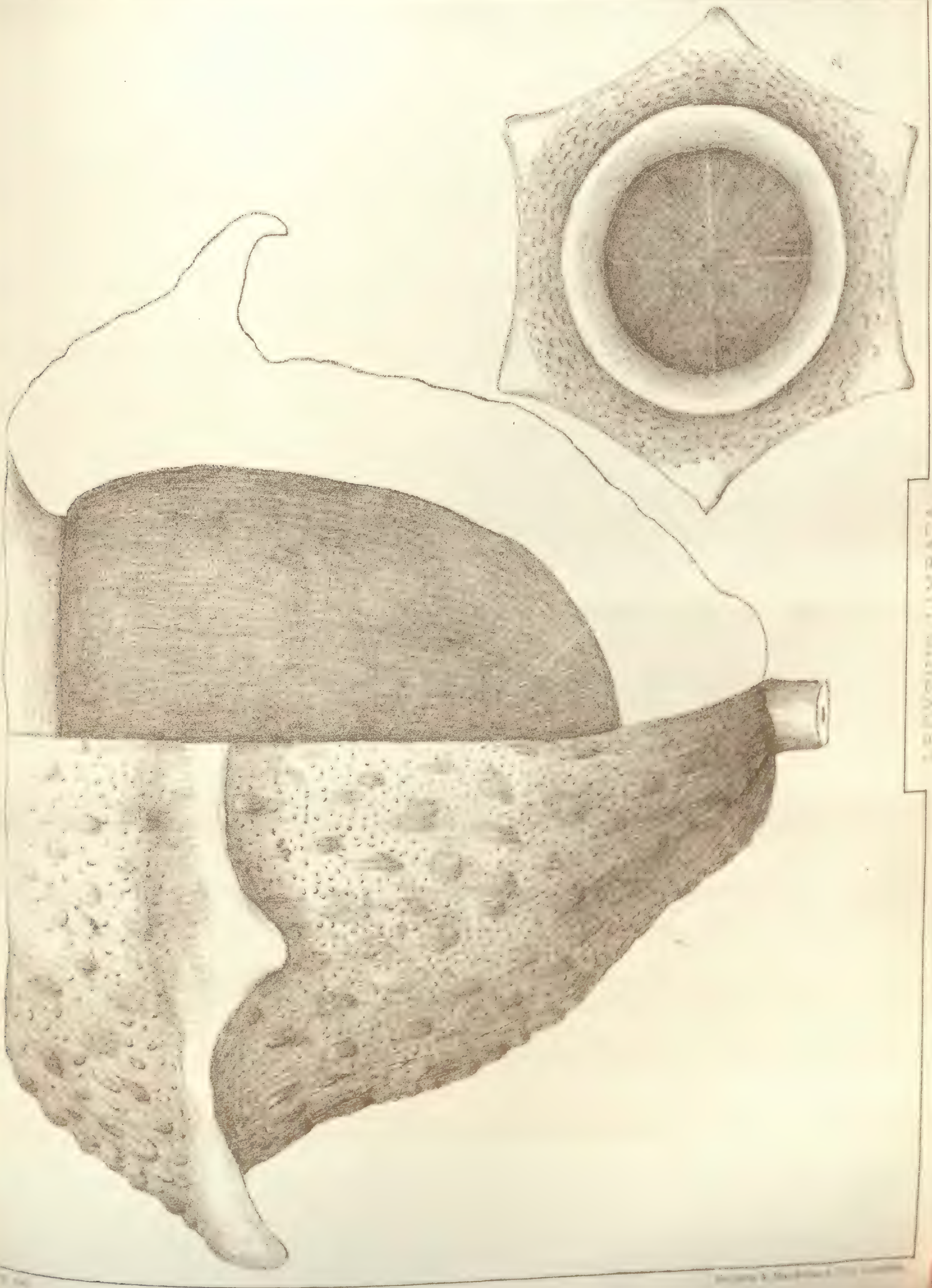


L. pyxidiforme.

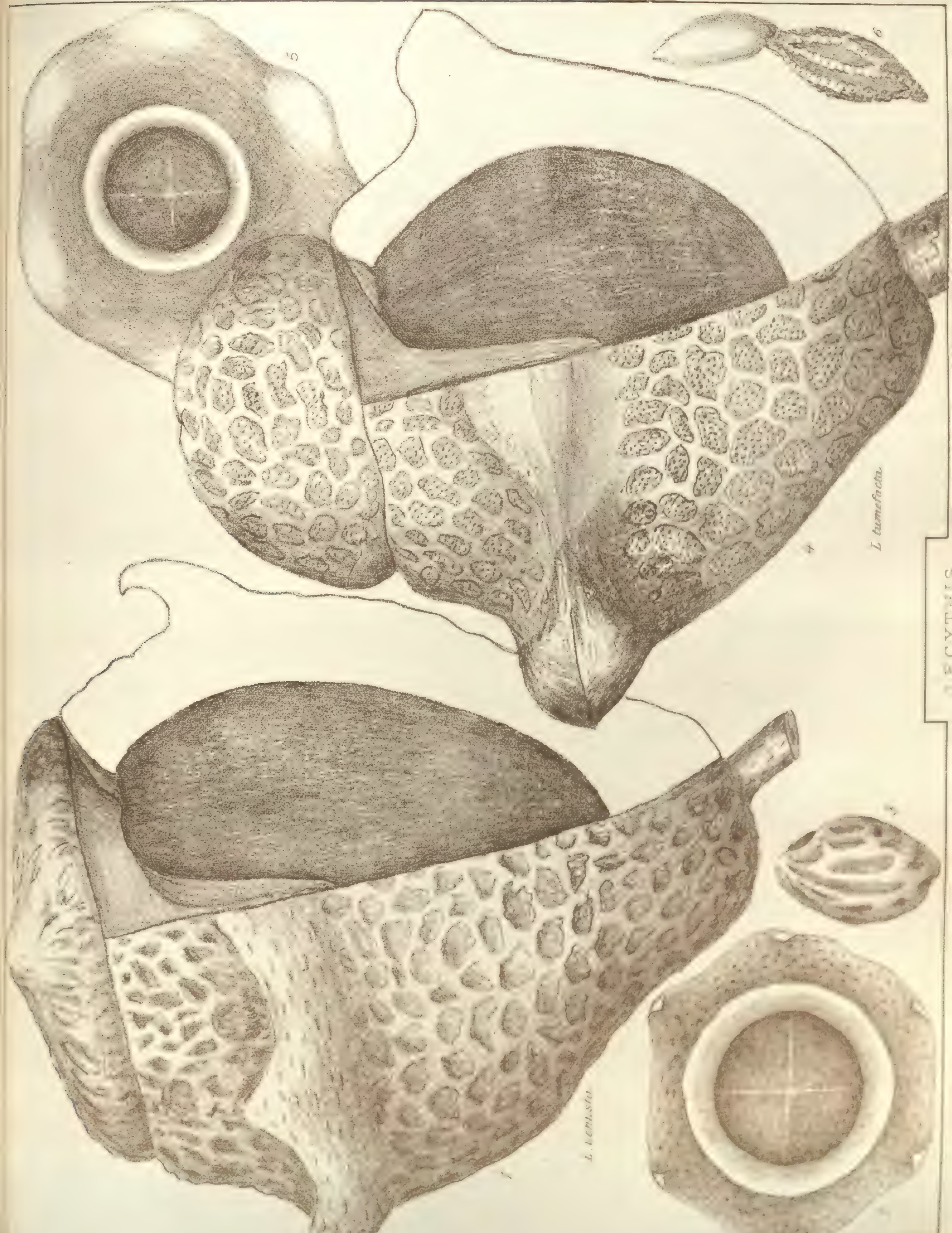
L. huxleyi.

L. ollula.

LECYTHIS.



LECYTHIS CRASSINODA.


L. tumefacta
L. ACRASIA

L. Coxiana

C. urceolata

C. grandifolia

C. angiocarpa

C. auriculata

C. Idaimoea

C. Mariae

C. cucullata

C. longipedicellata

CHEIROMA

REICHARDIELLA

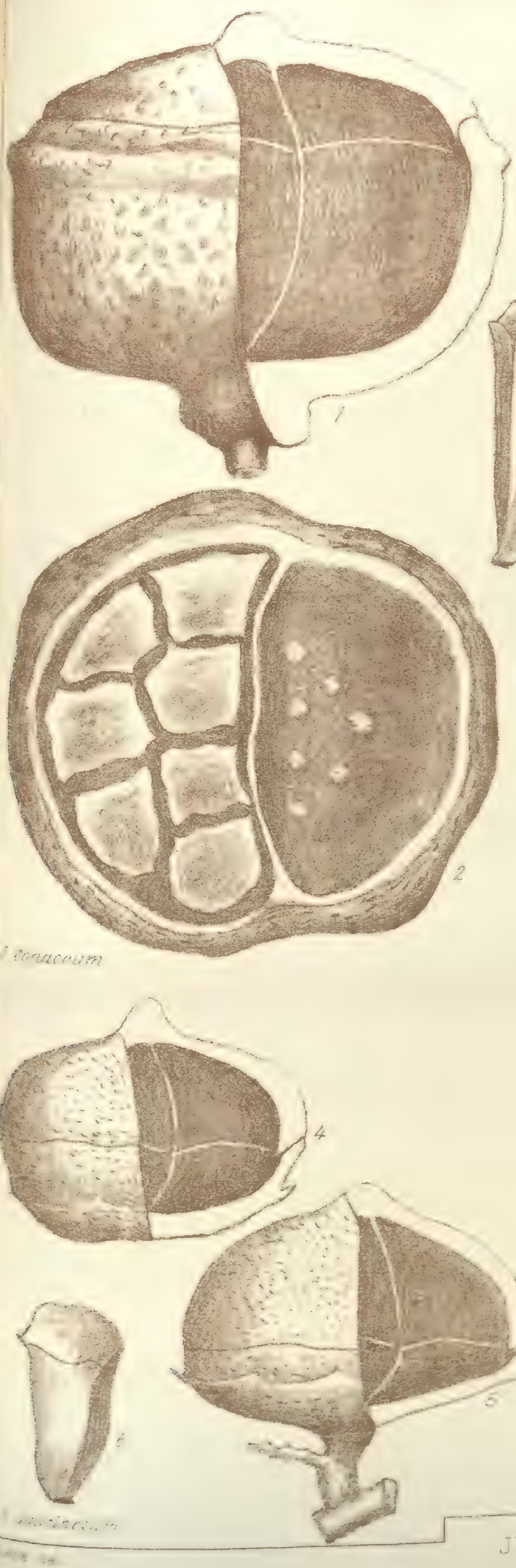
E. Fendleri

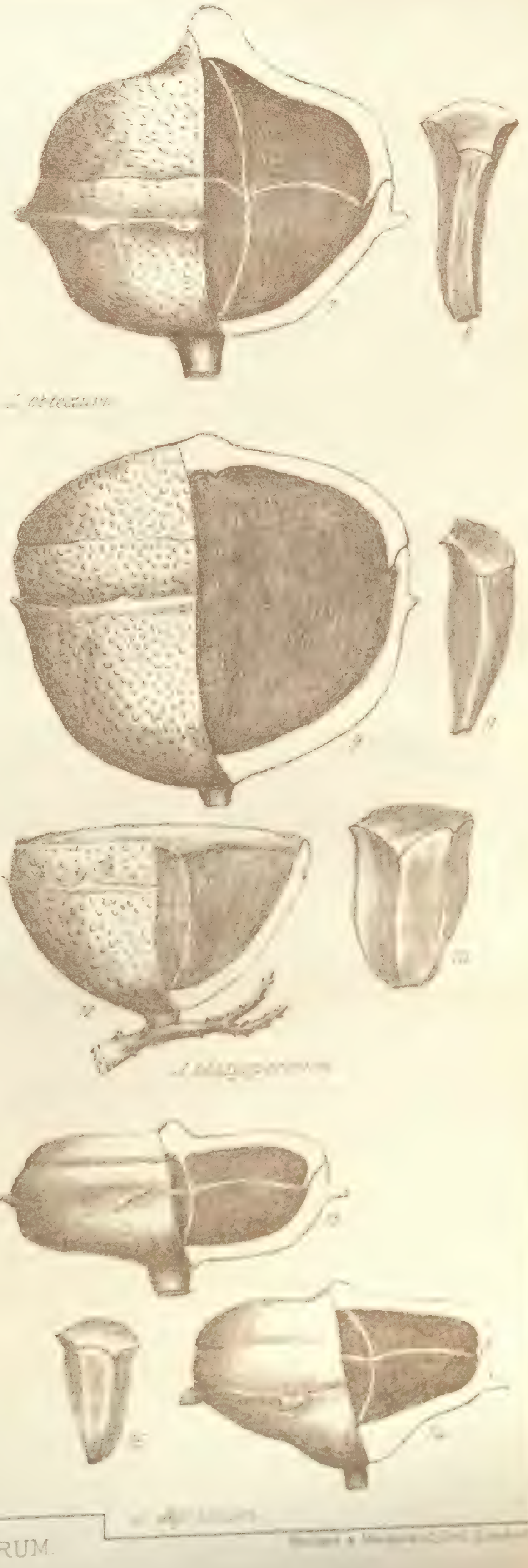
E. Guyanensis

E. ovulata

E. stramonia

E. Lycopersicum



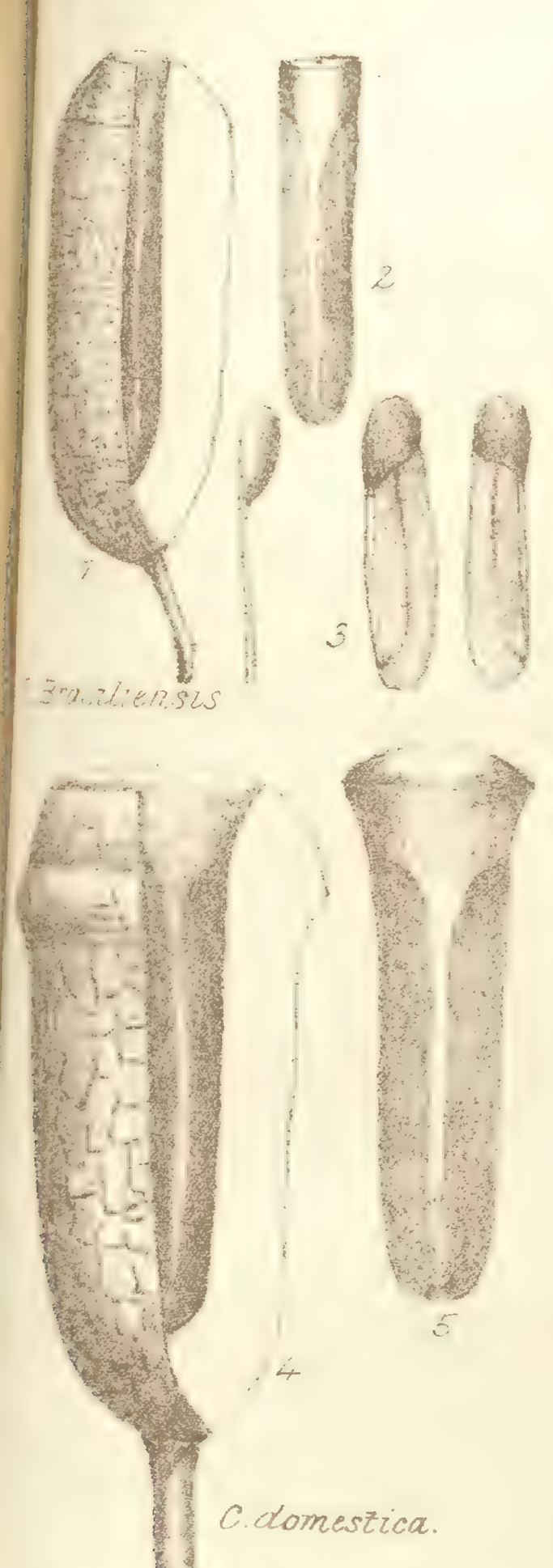


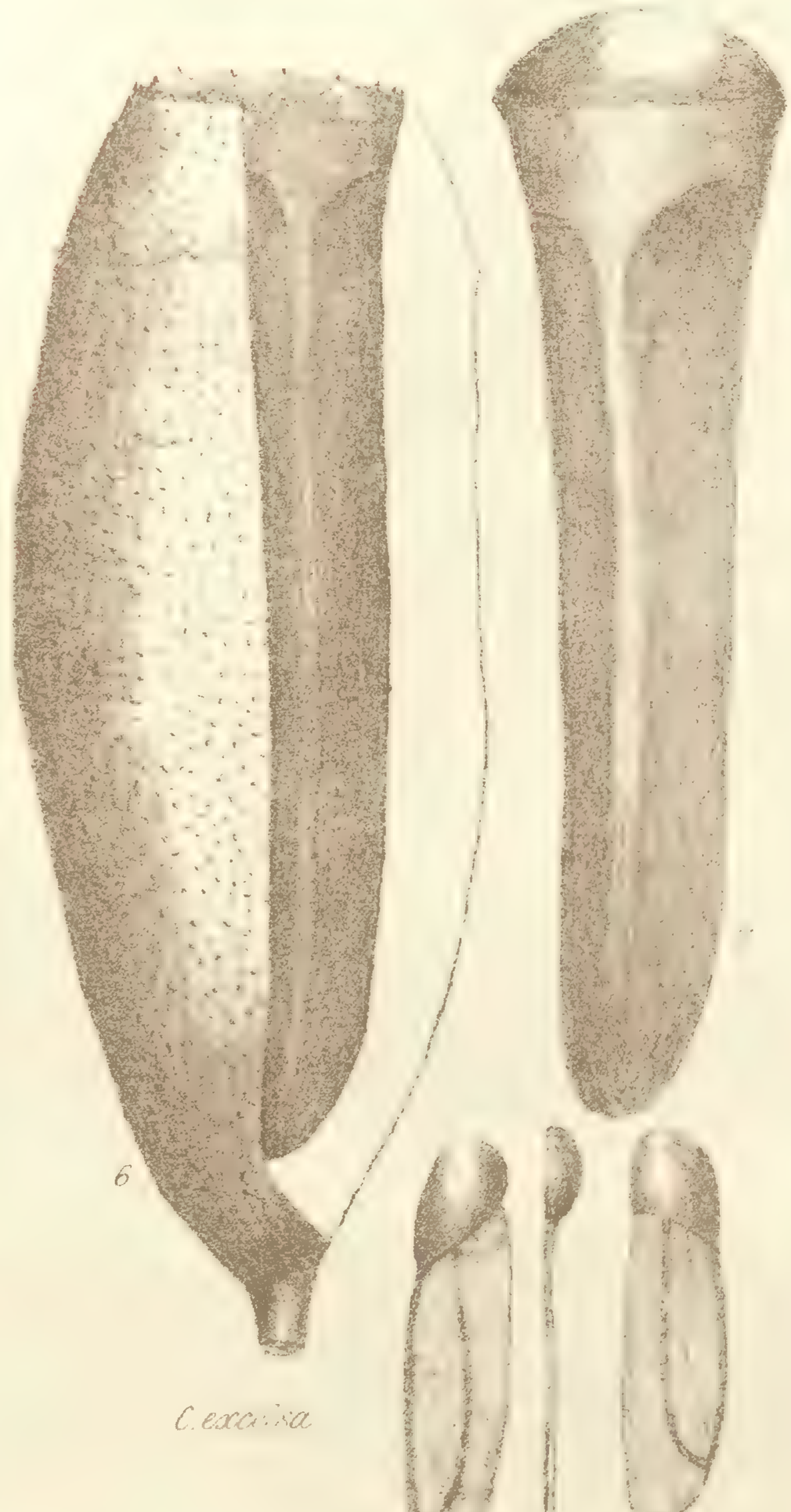
JUGASTRUM.

C. Martiana.

C. rufescens.

C. Guianensis.


2
1
3
C. brasiliensis
4
5
C. domestica.

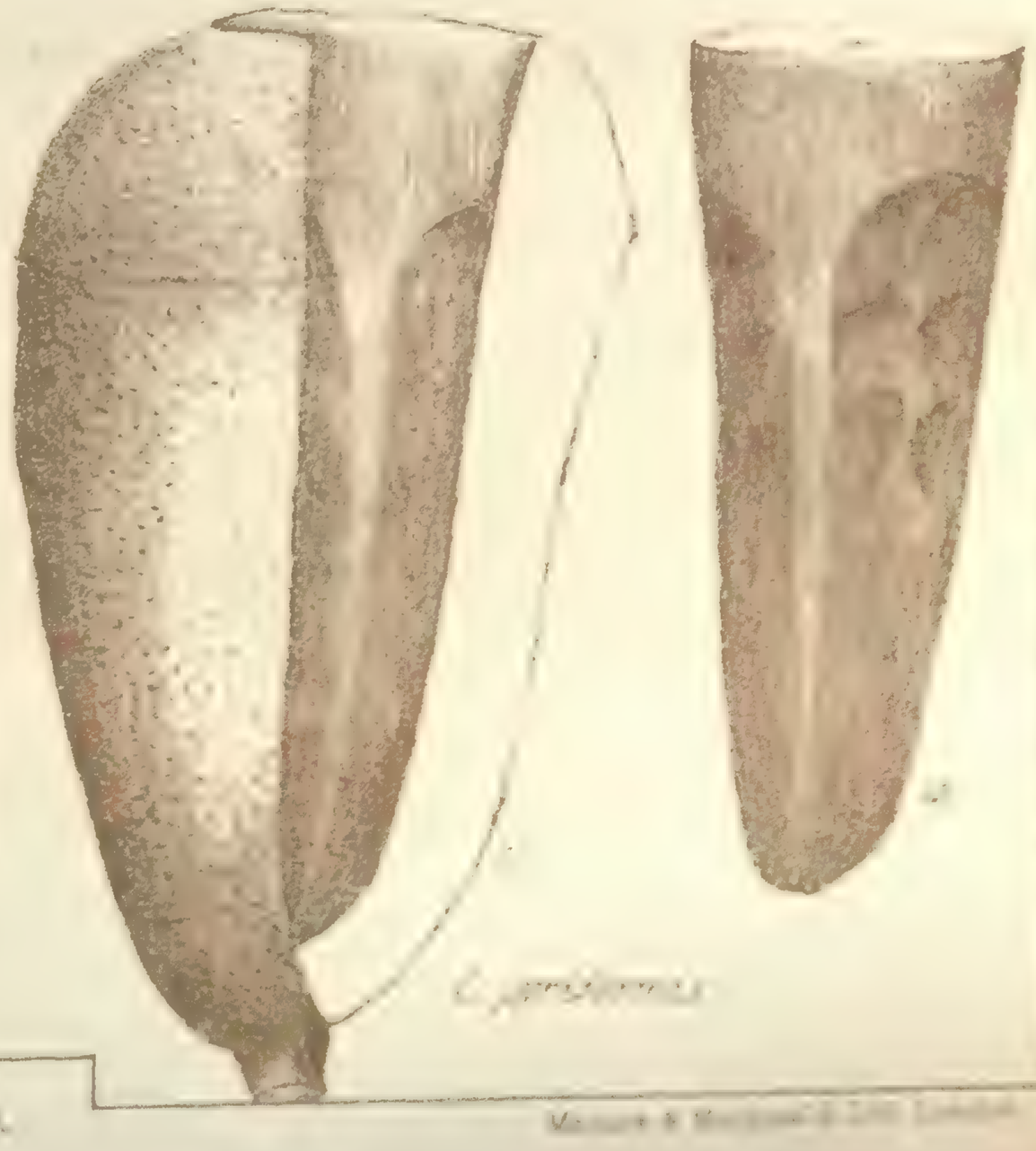

6
C. excelsa

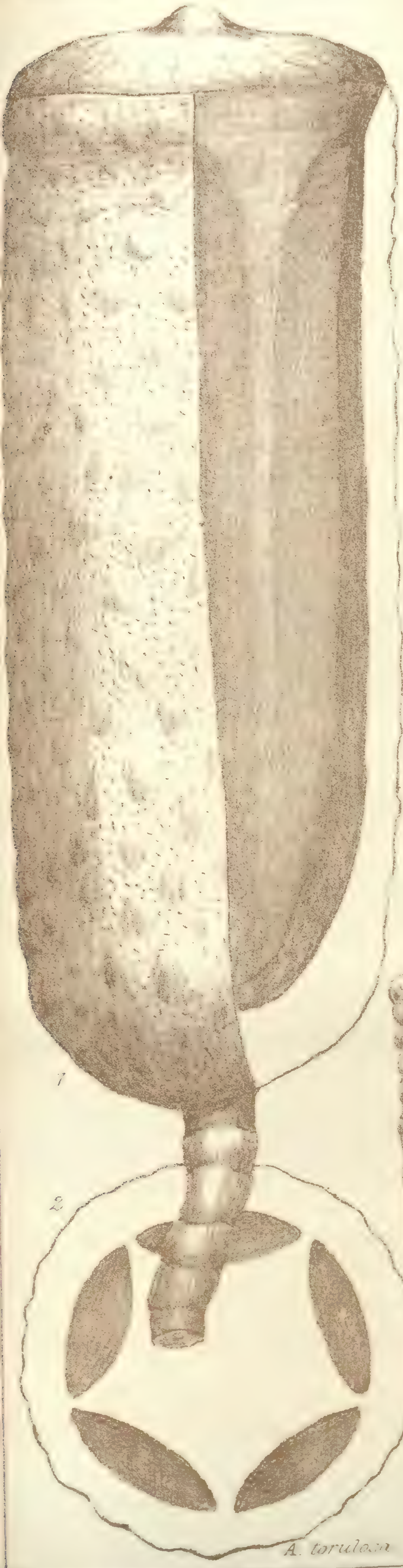
8

9
C. nahuquensis.

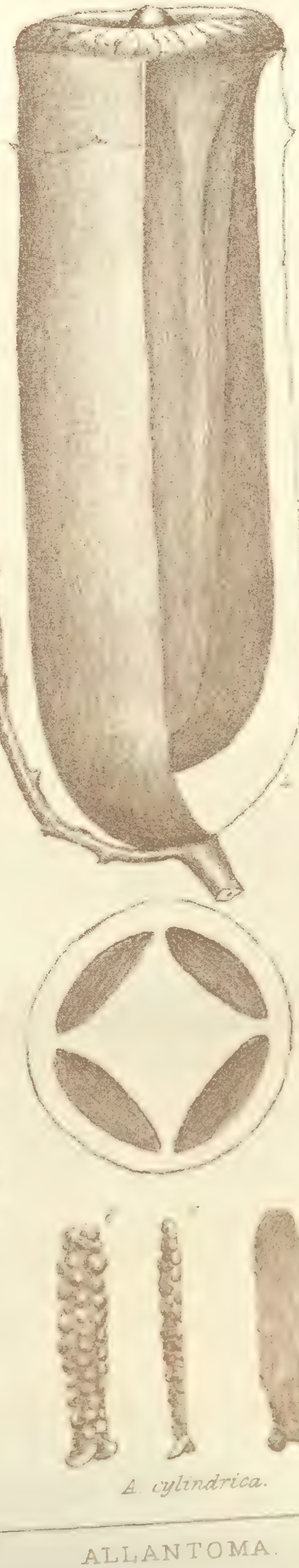
10
C. rubra.

11


C. pentandra



A. torulosa.



A. cylindrica.

A. macrocarpa.

A. dictyocarpa.

ALLANTOMA.

Miers, del

1

2

3

A. scutellata.

4

5

A. lineata.

6

7

8

A. Burchellana.

9

A. allocarpa

10

A. cortina

11

ALLANTOMA.

Maclure & Macdonald, Lith. London

J. Moore del.

VI. *Systematic List of the Spiders at present known to inhabit Great Britain and Ireland.* *By the* Rev. O. P. Cambridge, *M.A., C.M.Z.S.*

Read February 19th, 1874.

During the last five years a constant communication and interchange of typical examples of spiders has been going on between Dr. T. Thorell, of Upsala, Sweden, Dr. L. Koch, of Nürnberg, Bavaria, Mons. Eugène Simon, of Paris, myself, and others, with a view to a determination of the synonymic identity of the spiders recorded as indigenous to Europe, but principally to Sweden, England, Germany, and France. The results of this investigation have been published by Dr. Thorell in a most laborious and exhaustive work, lately completed, 'On the Synonyms of European Spiders.' The effect of this work is to give priority to names of many British Spiders, described by Mr. Blackwall and myself, other than the names they bear in our works; the time, therefore, appears to have arrived when a list, complete to the present time, of the known spiders of Great Britain and Ireland, under the names to which, according to the laws of priority, they appear to be entitled, seems to be a desideratum. Dr. Thorell, indeed (Syn. Eur. Spid. p. 471), gives a list of British Spiders; but it is complete only to the date of Mr. Blackwall's work the 'Spiders of Great Britain and Ireland' [1859–1864], since the publication of which the number of known indigenous species has increased by more than one half.

The systematic arrangement of Mr. Blackwall has not been adopted in this list, appearing, as it did, to be too artificial and based on insufficient (though in some respects convenient) characters, and moreover never to have found favour with other Araneologists. The present arrangement (though it has no pretensions to finality) is the result of a long and tolerably careful study of spiders from many and widely distant regions of the world. It begins at the opposite end to that where Dr. Thorell and Dr. Koch begin their systematic arrangements; but it is yet in the main not very discordant from that of the former of those authors, as put forth in his invaluable work 'On the Genera of European Spiders,' a work to which I am indebted for many most valuable hints on the classification of the Araneidea.

In the present list the genera adopted by Mr. Blackwall and myself in former works and papers have been largely broken up, following mainly the generic limits proposed by Dr. Thorell in the work above mentioned. The genera *Linyphia*, *Neriene*, and *Walckenaëra*, however, have been left almost as limited by Mr. Blackwall—not because they are thus satisfactory to myself, but because I have been as yet unable to arrive at a method of satisfactorily dealing with those difficult groups, though my attention is at this moment particularly directed to the two latter.

In those instances where a spider is considered to be now entitled to a name different from and prior to that under which it was formerly published by Mr. Blackwall or my-

self, the name so published is added after the one to which priority appears to be due; and in all cases the name of the author to whom priority has been ascertained to belong is appended in the usual way to the name of the spider, whether generic or specific.

All other synonyms and references, as well as descriptions and figures, may be found in the following:—

i. 'A History of the Spiders of Great Britain and Ireland,' by John Blackwall, Esq., Lond., 1859–64; together with papers by the same and other authors there referred to; and also other papers subsequently published by Mr. Blackwall in Annals & Mag. Nat. Hist. 1864–72.

ii. Papers published by the Rev. O. P. Cambridge in Trans. Linn. Soc. vol. xxvii. pp. 393–463, pl. liv.–lvii., with papers by the same, there referred to; also in Trans. Linn. Soc. vol. xxviii. part 3, pp. 433–458, pls. xxxiii.–xxxv.; and part 4, pp. 523–555, pls. xlv.–xlvi.; Journ. Linn. Soc. vol. xi. pp. 530–547, pls. xiv. & xv.; Proceedings Zool. Soc. 1873, pp. 747–769, pls. lxv. & lxvi.

iii. 'On European Spiders,' by Dr. T. Thorell. Upsala, 1869–70, pp. 1–242; and 'Synonyms of European Spiders,' by the same author. Upsala, 1871–73, pp. 1–644.

Class ARACHNIDA,

Order Araneidea (or Araneæ).

Fam. THERAPHOSIDES.

Gen. Atypus, *Latr.*

Atypus piceus, *Sulz.* A. Sulzeri, *Bl.**, *ad partem* (♀).
—— affinis, *Eichwald.* A. Sulzeri, *Bl.*, *ad partem* (♂).

Fam. DYSDERIDES.

Gen. Oonops, *Templeton.*

Oonops pulcher, *Templ.*

Gen. Schœnobates, *Bl.*

Schœnobates Walkeri, *Bl.*

Gen. Dysdera, *Latr.*

Dysdera Cambridgii, *Thorell.* D. erythrina, *Bl.*
—— crocota, *C. Koch.* D. rubicunda, *Bl.*

Gen. Harpactes, *Templ.*=Dysdera, *Bl.*, *ad partem.*

Harpactes Hombergii, *Scop.*

Gen. Segestria, *Latr.*

Segestria florentina, *Rossi.* S. perfida, *Bl.*
—— senoculata, *Linn.*

* Here, and in many other instances in this secondary portion of the list, the author quoted is not necessarily the one to whom the name attached to the spider is due; it merely points out that the author had adopted that specific name in some one or more of his works above referred to.

Fam. DRASSIDES.

Gen. MICARIA, *C. Koch.* = Drassus, *Bl.*, *ad partem.*

Micaria pulicaria, *Sund.* D. nitens + D. micans, *Bl.*

Gen. DRASSUS, *Walck.* = Drassus, *Bl.*, *ad partem.*

Drassus ferrugineus, *Bl.*

—— Blackwallii, *Thor.* D. sericeus, *Bl.*

—— reticulatus, *Bl.*

—— sylvestris, *Bl.*

—— cupreus, *Bl.*

—— troglodytes, *C. Koch.* D. clavator, *Cambr.*

—— lapidicolens, *Walck.*

—— pubescens, *Thor.* D. pubescens, *Thor.*, *Cambr.*

—— ? subniger, *Cambr.*

Gen. GNAPHOSA, *Latr.* = Drassus, *Bl.*, *ad partem.*

Gnaphosa anglica, *Cambr.* D. lucifugus, *Bl.*

—— lucifuga, *Leach.*

Gen. PROSTHESIMA, *L. Koch.* = Drassus, *Bl.*, *ad partem.*

Prosthesima pedestris, *C. Koch.*

—— Petiverii, *Scop.* D. ater, *Bl.*

—— nigrita, *Fabr.* D. pusillus, *Bl.*

—— electa, *C. Koch.* D. pumilus, *Bl.*

Gen. CLUBIONA, *Latr.* = Clubiona, *Bl.*, *ad partem.*

Clubiona grisea, *L. Koch.* C. holosericea, *Bl.*

—— terrestris, *Westr.* C. amarantha, *Bl.*

—— pallidula, *Clerck.* C. epimelas, *Bl.*

—— corticalis, *Walck.*

—— brevipes, *Bl.*

—— comta, *C. Koch.*

—— trivialis, *C. Koch.*

—— subtilis, *L. Koch.* C. pallens, *Bl.*

—— pallens, *C. Koch.* C. diversa, *Cambr.*

—— lutescens, *L. Koch.* C. assimilata, *Cambr.*

—— neglecta, *Cambr.*

—— formosa, *Templeton*, *Bl.*

—— holosericea, *De Geer.* C. deinognatha, *Cambr.*

—— voluta, *Cambr.*

—— reclusa, *Cambr.*

Gen. CHIRACANTHIUM, *C. Koch.* = Clubiona, *Bl.*, *ad partem.*

Chiracanthium nutrix, *Westr. non Bl.*

—— erraticum, *Bl.* Clubiona erratica, *Bl.*

—— carnifex, *C. Koch.*

—— Pennyi, *Cambr.*

Gen. ANYPHÆNA, *Sund.* = Clubiona, *Bl.*, *ad partem.*

Anyphæna accentuata, *Walck.*

Gen. AGRŒCA, *Westr.* = Agelena, *Bl.*, *ad partem.*

Agrœca brunnea, *Bl.*

—— proxima, *Cambr.*

Gen. LIOCRANUM, *L. Koch.* = Clubiona, *Bl.*, *ad part.* + Agelena, *Bl.*, *ad part.* + Drassus, *Cambr.*, *ad part.*

Liocranum domesticum, *Reuss-Wid.*

—— gracilipes, *Bl.*

—— prælongipes, *Cambr.*

——? celans, *Bl.*

Gen. HECAËRGE, *Bl.*

Hecaërge maculata, *Bl.* H. spinimana, *Bl.*

—— nemoralis, *Bl.*

Gen. PHRUROLITHUS, *C. Koch.* = Drassus, *Bl.*, *ad partem.*

Phrurolithus festivus, *C. Koch.* Drassus propinquus, *Bl.*

Fam. DICTYNIDES.

Gen. ERESUS, *Walck.*

Eresus cinnabarinus, *Oliv.*

Gen. DICTYNA, *Sund.* = Ergatis, *Bl.*

Dictyna arundinacea, *Linn.* Ergatis benigna, *Bl.*

—— uncinata, *Westr.* E. arborea, *Cambr.*

—— pusilla, *Westr.*

—— latens, *Fabr.*

—— variabilis, *C. Koch.* E. pallens, *Bl.*, var.

Fam. AGELENIDES.

Gen. ARGYRONETA, *Latr.*

Argyroneta aquatica, *Clerck.*

Gen. AMAURORIUS, *C. Koch.* = Ciniflo, *Bl.*, *ad partem.*

Amaurobius fenestralis, *Strœm.* A. atrox, *Koch, Bl.*

—— similis, *Bl.*

—— ferox, *Walck.*

Gen. LETHIA, *Menge*, = Ciniflo, *Bl.*, *ad partem.*

Lethia puta, *Cambr.*

—— humilis, *Bl.*

—— Mengii, *Cambr.*

Gen. CŒLOTES, *Bl.*

Cælotes atropos, *Walck.* C. saxatilis, *Bl.*

——? mœrens, *Cambr.*

——? immaculatus, *Cambr.*

Gen. AGELENA, *Walck.* = Agelena, *Bl.*

Agelena labyrinthica, *Clerck.*

—— Hyndmannii, *Templ., Bl.*

—— prompta, *Bl.*

Gen. TEGENARIA, *Latr.*

Tegenaria Guyonii, *Guér.* T. domestica, *Bl.*

—— atrica, *C. Koch.*

—— campestris, *C. Koch.*

—— Derhamii, *Scop.* T. civilis, *Bl.*

—— cicurea, *C. Koch.*

Gen. TEXTRIX, *Sund.*

Textrix denticulata, *Oliv.* T. lycosina, *Bl.*

—— boopis, *Cambr.* Agelena boopis, *Cambr.*

Gen. CRYPHŒCA, *Thor.* = Tegenaria, *Bl., ad partem.*

Cryphœca silvicola, *C. Koch.*

Gen. HAHNIA, *C. Koch.* = *Bl., ad partem.*

Hahnia elegans, *Bl.*

—— nava, *Bl.* Agelena subfusca, *Cambr.*

—— montana, *Bl.*

Fam. SCYTODIDES.

Gen. SCYTODES, *Latr.*

Scytodes thoracica, *Latr.*

Fam. PHOLCIDES.

Gen. PHOLCUS, *Walck.*

Pholcus phalangioides, *Fuessl.*

Fam. THERIDIIDES.

Gen. EPISINUS, *Walck.* = Theridion, *Bl., ad partem.*

Episinus truncatus, *Walck.* Theridion angulatum, *Bl.*

Gen. PHOLCOMMA, *Thor.* = Theridion, *Cambr., ad partem.*

Pholcomma gibbum, *Westr.* Theridion projectum, *Cambr.*

Gen. THERIDION, *Walck.* = Theridion, *Bl., ad partem.*

Theridion formosum, *Clerck.* T. sisyphum, *Bl.*

—— tepidariorum, *C. Koch.*

—— riparium, *Bl.*

—— sisyphium, *Clerck.* T. nervosum, *Bl.*

—— denticulatum, *Walck.*

—— familiare, *Cambr.*

—— varians, *Hahn.*

—— tinctum, *Walck.*

—— simile, *C. Koch.*

Theridion venustum, *Walck.*?, *Cambr.*
—— coracinum, *C. Koch.*
—— triste, *C. Koch.*
—— spirifer, *Cambr.*
—— pulchellum, *Walck.*
—— ? auratum, *Templ.*, *Bl.*
—— bimaculatum, *Linn.* T. carolinum, *Walck.*, *Bl.*
—— albens, *Bl.*
—— pallens, *Bl.*

Gen. NESTICUS, *Thor.* = Linyphia, *Bl.*, *ad partem.*
Nesticus cellulanus, *Clerck.* Linyphia crypticolens, *Bl.*

Gen. PHYLLONETHIS, *Thor.* = Theridion, *Bl.*, *ad partem.*
Phyllonethis lineata, *Clerck.*
—— instabilis, *Cambr.* Theridion instabile, *Cambr.*

Gen. DIPŒNA, *Koch.* = Theridion, *Bl.*, *ad partem.*
Dipœna melanogaster, *C. Koch.* Theridion congener, *Cambr.*

Gen. STEATODA, *Sund.* = Theridion, *Bl.*, *ad partem.*
Steatoda bipunctata, *Linn.*
—— sticta, *Cambr.*
—— guttata, *Reuss-Wid.*
—— prona, *Menge*, *Cambr.*
—— ? hæmatostigma, *Templ. Bl.*
—— versuta, *Bl.*

Gen. EURYOPIS, *Menge.* = Theridion, *Bl.*, *ad partem.*
Euryopis inornata, *Cambr.* Theridion inornatum, *Id.*
—— Blackwallii, *Cambr.*
—— ? fusca, *Bl.*
—— flavomaculata, *C. Koch.*

Gen. ASAGENA, *Sund.* = Theridion, *Bl.*, *ad partem.*
Asagena phalerata, *Panz.* Theridion signatum, *Bl.*

Gen. NERIENE, *Bl.*, *ad partem.*
Neriene atra, *Bl.* N. longipalpis, *Bl. nec Sund.*
—— longipalpis, *Sund.*
—— promiscua, *Cambr.*
—— dentipalpis, *Reuss-Wid.*
—— graminicola, *Sund.*
—— pascalis, *Cambr.*
—— nigra, *Bl.*
—— tibialis, *Bl.*
—— longimana, *C. Koch.* N. vagans, *Bl.*
—— pygmæa, *Bl.*

Neriene rufipes, *Sund.* N. munda, *Bl.*
—— rubens, *Bl.*
—— isabellina, *C. Koch.* N. rubella, *Bl.*
—— bifida, *Cambr.*
—— vigilax, *Bl.*
—— herbigrada, *Bl.*
—— Huthwaitii, *Cambr.*
—— affinis, *Bl.*
—— dentata, *Reuss-Wid.*
—— fusca, *Bl.*
—— agrestis, *Bl.*
—— retusa, *Westr.* N. elevata, *Cambr.*
—— uncata, *Cambr.*
—— gibbosa, *Bl.*
—— tuberosa, *Bl.*
—— apicata, *Bl.*
—— cornuta, *Bl.*
—— bituberculata, *Reuss-Wid.*
—— excisa, *Cambr.*
—— Clarkii, *Cambr.*
—— latebricola, *Cambr.*
—— fugax, *Cambr.*
—— neglecta, *Cambr.*
—— livida, *Bl.*
—— albipunctata, *Cambr.* Drepanodus, *Menge.*
—— rufa, *Reuss-Wid.* N. rubripes, *Bl.*
—— abnormis, *Bl.*
—— ? saxatilis, *Bl.*
—— Sundevallii, *Westr.*
—— lucida, *Cambr.*
—— viaria *Bl.*
—— lapidicola, *Thor.* N. rufipes, *Bl.*
—— sylvatica, *Bl.*
—— fuscipalpis, *C. Koch.* N. gracilis, *Bl.*, + N. flavipes (*Bl.*).
—— penicillata, *Westr.* N. corticea, *Cambr.*
—— incisa, *Cambr.*
—— innotabilis, *Cambr.*
—— subtilis, *Cambr.*
—— conigera, *Cambr.*
—— cornigera, *Bl.*
—— pallipes, *Cambr.*
—— decora, *Cambr.*
—— anomala, *Cambr.*

Neriene pavitans, *Cambr.*
—— clara, *Cambr.*
—— prudens, *Cambr.*
—— morula, *Cambr.*
—— mollis, *Cambr.*
—— arundineti, *Cambr.*
—— formidabilis, *Cambr.*
—— aspera, *Cambr.*
—— aperta, *Cambr.*
—— hispida, *Cambr.*
—— furva, *Bl.*
—— pulla, *Bl.*
—— lugubris, *Bl.*
—— avida, *Bl.*
—— timida, *Bl.*
—— minima, *Walck.* N. parva, *Bl.*
—— bicuspis, *Cambr.*
—— sulcata, *Bl.*
—— dubia, *Bl.*
—— montana, *Bl.*
—— pilosa, *Templ. Bl.*
—— pallidula, *Templ. Bl.*
—— carinata, *Templ. Bt.*

Gen. WALCKENAËRA, *Bl.*

Walckenaëra subæqualis, *Westr.* W. fortuita, *Cambr.*
—— pratensis, *Bl.*
—— brevis, *Reuss-Wid.* W. depressa, *Bl.*
—— brevipes, *Westr.*
—— scabrosa, *Cambr.*
—— Meadii, *Cambr.*
—— præcox, *Cambr.*
—— incurvata, *Cambr.*
—— diceros, *Cambr.*
—— saxicola, *Cambr.*
—— Hardii, *Bl.*
—— cuspidata, *Bl.*
—— unicornis, *Cambr.*
—— monoceros, *Reuss-Wid.*
—— obtusa, *Bl.*
—— nudipalpis, *Westr.*
—— punctata, *Bl.*
—— sordidata, *Thor.* W. atra, *Bl.*

Walckenaëra parva, *Bl.*
—— turgida, *Bl.*
—— bicolor, *Bl.*
—— bifrons, *Bl.*
—— exilis, *Bl.*
—— vafra, *Bl.*
—— humilis, *Bl.*
—— affinitata, *Cambr.*
—— cristata, *Bl.*
—— cucullata, *Koch.*
—— antica, *Reuss-Wid.*
—— permixta, *Cambr.*
—— fuscipes, *Bl.*
—— cirrifrons, *Cambr.*
—— ignobilis, *Cambr.*
—— scabricula, *Westr.* W. aggeris, *Cambr.*
—— parallela, *Bl.* [*Reuss-Wid., non Westr.*].
—— pumila, *Bl.*
—— obscura, *Bl.*
—— flavipes, *Bl.*
—— hiemalis, *Bl.*
—— latifrons, *Cambr.*
—— implana, *Cambr.*
—— Beckii, *Cambr.*
—— picina, *Bl.*
—— pusilla, *Reuss-Wid.* W. minima, *Cambr.*
—— erythropus, *Westr.* W. borealis, *Cambr.*
—— nemoralis, *Bl.*
—— ludicra, *Cambr.*
—— similis, *Cambr.*
—— altifrons, *Cambr.*
—— Thorellii, *Westr.* W. fastigata, *Bl.*
—— nodosa, *Cambr.*
—— trifrons, *Cambr.*
—— frontata, *Bl.*
—— acuminata, *Bl.*
—— furcillata, *Menge.*

Gen. PACHYGNATHA, *Sund.*
Pachygnatha Clerckii, *Sund.*
—— Listeri, *Sund.*
—— Degeerii, *Sund.*

Gen. TAPINOPA, *Westr.* = Linyphia, *Bl., ad partem.*
Tapinopa longidens, *Bl., Reuss-Wid.*

Gen. LINYPHIA, *Latr.* = Linyphia, *Bl.*, *ad partem*+Neriëne, *Bl.*, *ad partem* +Theridion, *Bl.*, *ad partem*+Bathyphantes, *Menge*, *ad partem*.

Linyphia frenata, *Bl.*, *Reuss-Wid.*
—— thoracica, *Reuss-Wid.* L. cauta, *Bl.*
—— nebulosa, *Sund.* L. vivax, *Bl.*
—— leprosa, *Ohl.* L. confusa, *Cambr.*
—— minuta, *Bl.*
—— tenebricola, *Reuss-Wid.* L. terricola, *Bl.*, + L. tenuis, *Bl.*
—— obscura, *Bl.*
—— variegata, *Bl.* Neriene variegata, *Bl.*
—— lepida, *Cambr.*
—— alacris, *Bl.*
—— albula, *Cambr.*
—— circumcincta, *Cambr.*
—— setosa, *Cambr.*
—— socialis, *Sund.*
—— luteola, *Bl.* L. alticeps, *Bl.*
—— alticeps, *Sund.*
—— crucigera, *Bl.*
—— cristata*, *Menge.* Bathyphantes cristatus, *Menge.*
—— explicata, sp. n., *N.* L. decolor, *Cambr.*
—— cingulipes, *Cambr.*
—— flavipes, *Bl.*
—— nigrina, *Westr.* L. pulla, *Bl.*
—— pullata, *Cambr.*
—— Meadii, *Bl.*
—— approximata, *Cambr.*
—— dorsalis, *Reuss-Wid.* L. anthracina + L. Claytoniæ, *Bl.*
—— gracilis, *Bl.*
—— ericæa, *Bl.*
—— circumspecta, *Bl.*
—— angulipalpis, *Westr.*
—— experta, *Cambr.*
—— errans, *Bl.* Neriene errans, *Bl.*
—— oblonga, *Cambr.*
—— rufa, *Westr.*
—— bicolor, *Bl.* Neriene bicolor, *Bl.*
—— linguata, *Cambr.*
—— reticulata, *Cambr.*
—— prudens, *Cambr.*
—— arcana, *Cambr.*

* This species is now recorded for the first time as British. It was received in 1872 from Mr. J. Hardy, by whom it was found in Berwickshire, and has hitherto been confused with *L. explicata*, sp. n. (*L. decolor*, Cambr.).

Linyphia contrita, *Cambr.*
—— parvula, *Westr.* L. longipes, *Cambr.* Bathyphantes longipes, *Menge.*
—— inconspicua, *Cambr.*
—— oblivia, *Cambr.*
—— oblita, *Cambr.*
—— microphthalma, *Cambr.*
—— pallida, *Cambr.*
—— decens, *Cambr.*
—— finitima, *Cambr.*
—— concolor, *Reuss-Wid.* Theridion filipes, *Bl.*
—— insignis, *Bl.*
—— impigra, *Cambr.*
—— clathrata, *Sund.* Neriene marginata, *Bl.*
—— furtiva, *Cambr.*
—— bucculenta, *Clerck.* Neriene trilineata, *Bl.*
—— marginata, *C. Koch.* L. triangularis, *Bl.*
—— montana, *Clerck.* L. marginata, *Bl.*
—— triangularis, *Clerck.* L. montana, *Bl.*
—— peltata, *Reuss-Wid.* L. rubea, *Bl.*
—— pusilla, *Sund.* L. fuliginea, *Bl.*
—— hortensis, *Sund.* L. pratensis, *Bl.*
—— pernix, *Bl.*
—— nigella, *Bl.*
—— pulchella, *Bl.*
—— furva, *Bl.*
—— tenella, *Bl.*
—— natata, *Templ.*, *Bl.*

Gen. Ero, *C. Koch.*=Theridion, *Bl.*, *ad partem.*
Ero thoracica, *Reuss-Wid.* T. variegatum, *Bl.*

Fam. EPEIRIDES.

Gen. Meta, *C. Koch.* = Epeira, *Bl.*, *ad partem.*
Meta segmentata, *Clerck.* Epeira inclinata, *Bl.*, + E. Mengii, *Bl.*
—— Merianæ, *Scop.* Epeira antriada, *Bl.*, + E. celata, *Bl.*
—— Menardi, *Latr.* Epeira fusca, *Bl.*

Gen. Tetragnatha, *Latr.*
Tetragnatha extensa, *Linn.*

Gen. Cyrtophora, *Sim.* = Epeira, *Bl. ad partem.*
Cyrtophora conica, *Pall.* E. conica, *Bl.*

Gen. Singa, *C. Koch.* Epeira, *Bl.*, *ad partem.*
Singa hamata, *Clerck.* Epeira tubulosa, *Bl.*

Singa pygmæa, *Sund.* Epeira anthracina, *Bl.*
—— sanguinea, *C. Koch.* Epeira Herii, *Bl.*
—— albovittata, *Westr.* Epeira calva, *Bl.*

Gen. CERCIDIA, *Thor.* = Epeira, *Bl.*, *ad partem.*
Cercidia prominens, *Westr.* Epeira bella, *Meade.*

Gen. ZILLA, *C. Koch.* = Epeira, *Bl.*, *ad partem.*
Zilla x-notata, *Clerck.* Epeira similis, *Bl.*
—— atrica, *C. Koch.* Epeira calophylla, *Bl.*

Gen. EPEIRA, *Walck.*, *Thor.* = Epeira, *Bl.*, *ad partem.*
Epeira cucurbitina, *Clerck.*
—— adianta, *Walck.*
—— ceropegia, *Walck.*
—— alsine, *Walck.* Epeira lutea, *Bl.*
—— dioidea, *Walck.* E. albimacula, *Bl.*
—— diademata, *Clerck.* E. diadema, *Bl.*
—— scalaris, *Walck.*
—— angulata, *Clerck.*
—— arbustorum, *C. Koch.* E. bicornis, *Bl.*
—— agalena, *Walck.*
—— cornuta, *Clerck.* E. apoclisa, *Bl.*
—— patagiata, *Clerck.*
—— sclopetaria, *Clerck.* E. sericata, *Bl.*
—— quadrata, *Clerck.*
—— umbratica, *Clerck.*
—— acalypha, *Walck.*
—— solers, *Walck.*
—— Youngii, *Cambr.*
—— signata, *Bl.*
—— ornata, *Bl.*

Fam. ULOBORIDES.

Gen. ULOBORUS, *Latr.* = Veleda, *Bl.*
Uloborus Walckenaerius, *Latr.* Veleda lineata, *Bl.*

Gen. HYPTIOTES, *Walck.* = Mithras, *Bl.*
Hyptiotes paradoxus, *C. Koch.*

Fam. THOMISIDES.

Gen. THOMISUS, *Walck.*, *Thor.* = Thomisus, *Bl.*, *ad partem.*
Thomisus onustus, *Walck.* T. abbreviatus, *Bl.*

Gen. MISUMENA, *Latr.* = Thomisus, *Bl.*, *ad partem.*
Misumena vatia, *Clerck.* Thomisus citreus, *Bl.*
—— truncata, *Pall.* Thomisus horridus, *Fabr.*, *Cambr.*

Gen. Diæa, *Thor.*=Thomisus, *Bl., ad partem.*

Diæa dorsata, *Fabr.* Thomisus floricolens, *Bl.*

—— ? formosa, *Bl.*

Gen. Xysticus, *C. Koch.* = Thomisus, *Bl., ad partem.*

Xysticus cristatus, *Clerck.*

—— viaticus, *C. Koch, Cambr.*

—— pini, *Hahn.* Thomisus audax, *Bl.*

—— cinereus, *Bl.*, sp. inc.

—— lanio, *C. Koch, Cambr.*

—— sabulosus, *Hahn.*

—— brevipes, *Bl.*, sp. inc.

—— lynceus, *Latr.* T. atomarius, *Bl.*

—— luctuosus, *Bl.*

—— morio, *C. Koch.*

—— Cambridgii, *Bl.*

—— Gloveri, *Bl.*

—— erraticus, *Bl.*

—— ulmi, *Hahn.* Thomisus Westwoodii, *Cambr.*

—— bifasciatus, *C. Koch.*

—— luctator, *C. Koch.* X. impavidus, *Thor.* T. Cambridgii, *Cambr.*

—— praticola, *C. Koch.* Thomisus incertus, *Bl.*

—— claveatus, *Walck.*

—— sanctuarius, *Cambr.*

—— trux, *Bl.*

—— atomarius, *Panz.* T. versutus, *Bl.*

—— horticola, *C. Koch.* T. pallidus, *Bl.*

—— simplex, *Cambr.*

Gen. Philodromus, *Walck., Thor.* = Philodromus, *Bl., ad partem.*

Philodromus dispar, *Walck.*

—— margaritatus, *Clerck.* P. pallidus, *Bl.*, + P. jejunus, *Cambr.*

—— aureolus, *Clerck.*

—— cespiticolus, *Walck.*

—— prædatus, *Cambr.*

—— Clarkii, *Bl.*

—— variatus, *Bl.*

—— mistus, *Bl.*

—— elegans, *Bl.*

—— fallax, *Sund.* P. deletus, *Cambr.*

Gen. Thanatus, *C. Koch.* = Philodromus, *Bl., ad partem.*

Thanatus oblongus, *Walck.*

—— hirsutus, *Cambr.*

Gen. MICROMMATA, *Latr.* = Sparassus, *Bl.*

Micrommata virescens, *Clerck.* S. smaragdulus, *Bl.*, + S. ornatus, *Bl.*, var.

Fam. LYCOSIDES.

Gen. OCYALE, *Sav.*=Dolomedes, *Bl.*, *ad partem.*

Ocyale mirabilis, *Clerck.*

Gen. DOLOMEDES, *Latr.*=Dolomedes, *Bl.*, *ad partem.*

Dolomedes fimbriatus, *Clerck.* D. fimbriatus, *Bl.* D. ornatus, *Bl.*, var. jun.

Gen. PIRATA, *Sund.*=Lycosa, *Bl.*, *ad partem.*

Pirata hygrophilus, *Thor.* L. piscatoria, *Bl.*
—— piscatoria, *Clerck.* L. De Greyii, *Cambr.*
—— piraticus, *Clerck.* L. piratica, *Bl.*
—— latitans, *Bl.*
—— leopardus, *Sund.* L. cambrica, *Bl.*

Gen. TROCHOSA, *C. Koch.*=Lycosa, *Bl.*, *ad partem.*

Trochosa biunguiculata, *Cambr.*
—— cinerea, *Fabr.* L. allodroma, *Bl.*
—— picta, *Hahn.*
—— ruricola, *De Geer.* L. campestris, *Bl.*
—— terricola, *Thor.* L. agretyca, *Bl.*

Gen. LYCOSA, *Latr.*=Lycosa, *Bl.*, *ad partem.*

Lycosa amentata, *Clerck.* L. saccata, *Bl.*
—— agricola, *Thor.* L. fluviatilis, *Bl.*
—— Traillii, *Cambr.*
—— Farrenii, *Cambr.*
—— lugubris, *Walck.*
—— pullata, *Clerck.* L. obscura, *Bl.*
—— nigriceps, *Thor.* L. congener, *Cambr.*
—— herbigrada, *Bl.*
—— palustris, *Linn.* L. exigua, *Bl.*
—— monticola, *Clerck.*

Gen. TARENTULA, *Sund.*=Lycosa, *Bl.*, *ad partem.*

Tarentula miniata, *C. Koch.* L. nivalis, *Cambr.* L. miniata, *Id.*
—— pulverulenta, *Clerck.* L. rapax, *Bl.*
—— cuneata, *Clerck.* L. armillata, *Cambr.*
—— andrenivora, *Walck.*
—— fabrilis, *Clerck.*

Fam. SPHASIDES.

Gen. OXYOPES, *Latr.*=Sphasus, *Bl.*

Oxyopes lineatus, *Latr.*

Fam. SALTICIDES.

Gen. EPIBLEMUM, *Hentz.*=CALLIETHERA, *C. Koch.*=Salticus, *Bl., ad partem.*

Epiblemum scenicum, *Clerck.* Salticus histrionicus, *C. Koch, Cambr.*
S. scenicus, *Bl., saltem ad partem.*
—— cingulatum, *Panz.* Salticus scenicus, *C. Koch, Cambr., et Bl., ad partem* ?
—— affinitatum, *Cambr.* S. affinitatus, *Cambr.*

Gen. HELIOPHANUS, *C. Koch.* = Salticus, *Bl., ad partem.*

Heliophanus cupreus, *Walck.*
—— expers, *Cambr.*
—— flavipes, *C. Koch, Cambr.*

Gen. BALLUS, *C. Koch.* = Salticus, *Bl., ad partem.*

Ballus depressus, *Walck.* Salticus obscurus, *Bl.*

Gen. MARPESSA, *C. Koch.*=Salticus, *Bl., ad partem.*

Marpessa muscosa, *Clerck.* Salticus tardigradus, *Bl.*
—— Blackwallii, *Clark.*
—— nigrolimbata, *Cambr.* S. nigrolimbatus, *Id.*

Gen. EUOPHRYS, *C. Koch.* = Salticus, *Bl., ad partem.*

Euophrys frontalis, *Walck.*
—— promptus, *Bl.*
—— reticulatus, *Bl.*
—— æquipes, *Cambr.*
—— petrensis, *C. Koch.* Salticus coccociliatus, *Cambr.*

Gen. PHILÆUS, *C. Koch.* = Salticus, *Bl., ad partem.*

Philæus chrysops, *Poda.* S. sanguinolentus, *Linn., Cambr.*

Gen. ATTUS, *Walck.*=Salticus, *Bl., ad partem.*

Attus pubescens, *Fabr.* S. sparsus, *Bl.* S. terebratus, *Cambr.* S. pratincola, *Id.*
—— caricis, *Westr.*
—— notatus, *Bl.*
—— Jenynsii, *Bl.*
—— gracilis, *Bl.*, sp. inc.
—— erraticus, *Walck.* S. distinctus, *Bl.*
—— xanthogramma, *Bl.*, sp. inc.
—— falcatus, *Clerck.* S. coronatus, *Bl.*
—— grossipes, *Degeer* ?, *Cambr.*
—— citus, *Cambr.*
—— floricola, *C. Koch, Cambr.*

Gen. ÆLUROPS, *Thor.* = Salticus, *Bl., ad partem.*

Ælurops fasciatus, *Hahn.*

Gen. YLLENUS, *Sim.*=Salticus, *Bl., ad partem.*

Yllenus V- insignitus, *Clerck.* S. quinquepartitus, *Walck., Cambr.*

—— saltator, *Cambr., Sim.* S. floricola, *Bl.*

Gen. SALTICUS, *Latr.* = Salticus, *Bl., ad partem.*

Salticus formicarius, *Walck.*

Summary of Genera and Species of Spiders of Great Britain and Ireland.

Genera.	Species.
1. Atypus	2
2. Oonops	1
3. Schœnobates	1
4. Dysdera	2
5. Harpactes	1
6. Segestria	2
7. Micaria	1
8. Drassus	9
9. Gnaphosa	2
10. Prosthesima	4
11. Clubiona	15
12. Chiracanthium	4
13. Anyphæna	1
14. Agrœca	2
15. Liocranum	4
16. Hecaërge	2
17. Phrurolithus	1
18. Eresus	1
19. Dictyna	5
20. Argyroneta	1
21. Amaurobius	3
22. Lethia	3
23. Cœlotes	3
24. Agelena	3
25. Tegenaria	5
26. Textrix	2
27. Cryphœca	1
28. Hahnia	3
29. Scytodes	1
30. Pholcus	1
31. Episinus	1
32. Pholcomma	1
33. Theridion	18
34. Nesticus	1
35. Phyllonethis	2
36. Dipœna	1
37. Steatoda	6
38. Euryopis	4
39. Asagena	1
40. Neriene	76
41. Walckenaëra	55
42. Pachygnatha	3
43. Tapinopa	1
44. Linyphia	66
45. Ero	1
46. Meta	3
47. Tetragnatha	1
48. Cyrtophora	1
49. Singa	4
50. Cercidia	1
51. Zilla	2
52. Epeira	20
53. Uloborus	1
54. Hyptiotes	1
55. Thomisus	1
56. Misumena	2
57. Diæa	2
58. Xysticus	23
59. Philodromus	10
60. Thanatus	2
61. Micrommata	1
62. Ocyale	1
63. Dolomedes	1
64. Pirata	5
65. Trochosa	5
66. Lycosa	10
67. Tarentula	5
68. Oxyopes	1
69. Epiblemum	3
70. Heliophanus	3
71. Ballus	1
72. Marpessa	3
73. Euophrys	5
74. Philæus	1
75. Attus	11
76. Ælurops	1
77. Yllenus	2
78. Salticus	1

Total, 78 Genera; 457 Species.

THE

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M.DCCC.LXXV.

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VII. *Revision of the Suborder* Mimoseæ. *By* George Bentham, *Esq.*, *F.R.S.*

(Plates LXVI.–LXX.)

Read June 18th, 1874.

I HAVE within the last few years had occasion to lay before the Society some observations on two groups of plants which, however different in most respects, are both of them remarkably distinct in their circumscription, and as constantly uniform in those characters which it has been the custom to regard as the most essential. To the two might, indeed, have been assigned equal grades in the hierarchy of the Natural System, were it not for the enormous disproportion in the number of their species. Upon abstract principles, *Cassia* and *Compositæ* might equally well be treated as good genera; both are perfectly isolated; the pistil and seeds are uniform in each; the variations in the corolla are scarcely more marked in the one than in the other; the androecium and fruit present perhaps more important diversities in *Cassia* than in Compositæ: but *Cassia* has only 350 species, whilst Compositæ number 10,000. *Cassia* has therefore been universally retained as a single one, or at most only three genera, whilst Compositæ are variously divided into from 750 to 1200 genera. I have now to offer a few remarks on a third group, almost as definite in circumscription, and intermediate, as it were, between the two as to uniformity and numbers. The 1200 Mimoseæ are as uniform in their pistil as the 350 *Cassias* and 10,000 Compositæ; the corolla is more uniform than in either; the androecium and fruit are, as in *Cassia*, much more varied than in Compositæ. Like *Cassia*, the Mimoseæ were established by Linnæus as a single genus; and perhaps, if Compositæ had not been so largely extratropical, and consequently presented to his observation in considerable numbers, if he had only known that proportion of tropical forms which he possessed of the two other groups, he would probably have considered them also as forming only one or three genera; or, on the other hand, had not his specimens of Mimoseæ been so very few and meagre, or fragmentary, he would probably, from the first, have divided them into at least three genera. At the present day *Cassia*, almost restricted constitutionally to the shrubby or arborescent plant-form and tropical climate, and even there not prospering as a race in all stations, has remained within manageable limits as to numbers, and is still regarded as a single genus, divisible into three marked sections. Mimoseæ, which, with one great southern exception, have remained constitutionally, as well as geographically, within nearly the same limits as *Cassia*, have, however, nearly four times as many species, and are therefore admitted as a suborder, divisible into three marked tribes and some twenty to thirty genera; and Compositæ, with their prevalent herbaceous or low shrubby plant-form, flourishing especially in extratropical or mountain climes, shunning only low tropical forest lands, have nearly thirty times the number of species of *Cassia*, and have accordingly been subdivided into innumerable genera, often founded on characters which in *Cassia* and

Mimoseæ would scarcely be considered specific—a disproportionate treatment probably aggravated by the circumstance of the small number of botanists who have access to good working-materials in *Cassia* and Mimoseæ, whilst every beginner has Compositæ at hand to exercise his ingenuity in discovering minute differences in the pappus, the bracts, and other reduced organs, in indumentums or in stigmatic papillæ.

After Linnæus, the subdivision of his *Mimosa* into several distinct genera was first proposed by Willdenow, as based chiefly on the fruit; and his views have been generally followed out. Poiret, in the Supplement to the Encyclopædia, adopted his genera as sub-genera of *Mimosa*, which he still retained in its substantive collective character. Desfontaines, in the third edition of the Catalogue of the Paris Garden, united most of Willdenow's genera with *Acacia*. De Candolle, in 1825, with materials but little better than those which Willdenow had at his disposal, and in the absence of specimens of a large proportion of that author's species, reinstated his genera, adding a few exceptional species as monotypic or small genera. Martius, working on a limited number of Brasilian species, without any general survey of the group, proposed several additional genera founded upon Willdenow's principles; and when, in 1842, I undertook the publication of the rich collections, chiefly American, of the Berlin, the Hookerian, my own, and a few other herbaria, I found the limits and circumscriptions of the genera so confused and vague, that I thought it necessary to remodel them, *ab initio*, upon principles somewhat different from those which had till then prevailed, giving especially a first rank to characters derived from the andrœcium, which had been in a great measure disregarded. Twenty-seven years have now elapsed since I completed a series of Synopses in Hooker's Journals; and my genera appear to have been favourably received by the generality of botanists, with the exception, however, of Grisebach, who, misled sometimes by mismatched specimens, or by misunderstanding some of the characters I had given, has reverted to the preeminence of carpological over staminal characters. Here and there also individual botanists who have met with pods apparently different from those of their congeners, have proposed monotypic genera, upon grounds which appear to me insufficient. On the other hand, I have within these twenty years had the opportunity of inspecting a large number of typical species in the herbaria of Paris, Berlin, Vienna, Munich, Geneva, and Turin, and, on the occasion of working up the suborder for the Flora Brasiliensis, found reason to modify several of the details of my former Synopsis, to confirm a few of the genera about which I had some doubts, to give greater precision to the characters of others by the transfer of a few species to which, from insufficient specimens, I had assigned a wrong place, and especially to clear up a large number of doubtful synonyms. I have therefore thought the following general revision, with short characters for the whole of the species, might not be unserviceable to future investigators, to whom I must now leave the task of dissipating the obscurity which still prevails over a considerable number of them. I would also commence by a few observations on the generic characters I have adopted, and on geographical distribution.

The primary importance I attached to the staminal character appears to have stood the test of subsequent experience. No ambiguous species have presented themselves to invalidate the delimitation of the three great groups, nearly equal in point of numbers:—

Eumimoseæ, with definite stamens; *Acacieæ*, or the genus *Acacia*, with indefinite stamens, free or very shortly and irregularly united at the base in the centre of the flower; and *Ingeæ*, with indefinite stamens united, at least at the base, in a tube surrounding the pistil. Grisebach, it is true (Fl. Brit. W. Ind. 220), rejects the character because "decandrous species still exist among Bentham's *Acaciæ* and *Calliandræ*, e. g. *A. tamarindifolia*, W., and *C. mollissima*, Benth." But, as to one of them, he has mismatched the flowers of *Mimosa* with the fruiting specimens of the true *Acacia tamarindifolia*, which has always above 50 stamens; and *Calliandra mollissima*, although figured by Kunth as having 10 stamens, appeared to me to have them few, indeed, but variable in number; and they are accordingly described by Kunth as being *about* (not exactly) 10; they are also monadelphous at the base, not free as in the truly decandrous genera. A secondary character, however, by which I had separated Adenantheræ from Eumimoseæ, the presence of a glandular appendage to the anthers, has failed in a few instances. The genera *Parkia*, *Piptadenia*, and *Prosopis*, in which the anthers are usually provided with that appendage, have each of them one or two species in which it is wholly wanting, even in the unexpanded flower; and *Desmanthus*, where it is usually deficient, has a Madagascar species with a minute gland sometimes, if not always, present. *Xylia* also, which I had inadvertently placed among the eglandular genera, has, on the contrary, very prominent glands to the anthers.

I have now been able to introduce as a new generic character, apparently absolute, and especially useful for distributing the Eumimoseæ into two subordinate groups, but which I had formerly neglected, the presence or absence of albumen in the seeds. I was, indeed, aware that Schleiden and Vogel (Nov. Act. Nat. Cur. xix. part ii. 68) had ascertained the existence of albumen in some seeds only of Mimoseæ; but as they also stated that they found no constancy in this respect in the same genus, as I had not then the opportunity of verifying the circumstance in a sufficient number of cases, and as I was aware of the variability in this respect in some natural genera, such as *Polygala*, I did not feel justified in making any use of it in my generic characters. I now find, from the examination of a large number of seeds, that the albumen is constantly present or absent in each genus, as modified in my synopsis, although variable in some Willdenowian genera. Schleiden cites, as examples of inconstancy, three species of *Acacia*—*A. acanthocarpa*, *A. farnesiana*, and *A. Berteriana*, in which albumen is present, whilst in the majority of species the seeds are exalbuminous. But of those three the first is, in its stamens and other characters, a *Mimosa*, and not an *Acacia*. *A. farnesiana* is a true *Acacia*; but I think there must be some mistake on the part of Schleiden. I have examined half a dozen seeds taken from as many specimens grown in widely different localities, and found no trace of albumen in any of them. The seed is much thicker than in most species, the cotyledons remarkably thick, giving the embryo a globular or ovoid shape, not at all flattened; the testa is also thick in this as in several other of the *Gummiferæ*, and the inner or, rather, the intermediate layer of it is somewhat cartilaginous, having almost the appearance of the albumen of *Mimosa*; but it is continuous, and of equal thickness throughout the seed, not tapering towards the margins of the cotyledons, and is inseparable as well from the inner lining as from the outer coating of

the testa, and remains so after soaking for days; whilst the true albumen of *Mimosa* is quite detached from the testa, and after soaking for a day or two resolves itself into a transparent jelly. In *Acacia Berteriana*, which proves to be identical with my *Pithecolobium fragrans*, belonging to an exalbuminous group, I do find within the testa, on each side of the embryo, a small quantity of an almost gelatinous substance, the origin of which remains to be ascertained. It is certainly different in many respects both from the undoubted albumen of *Mimosa*, *Leucæna*, and their allies, and from the above-mentioned inner coating of *Acacia farnesiana*; but whether it is an exudation from the inner seed-coating, or a real albumen, as supposed by Schleiden, remains doubtful. I find no trace of it in the seeds of the nearest allied species, *Pithecolobium polycephalum*.

The universally acknowledged importance of carpological characters in the general classification of phenogamous plants has induced the majority of botanists to rely mainly upon them for the detailed subdivision of Mimoseæ, with results above alluded to as being far from satisfactory. There are species of *Piptadenia*, of *Acaciæ* (*Vulgares*), and of *Albizzia*, of which the pods can scarcely be distinguished from each other, whilst in flowers and all other characters these *Piptadeniæ* are much more nearly allied to *Adenanthera* or *Entada*, the *Acaciæ* (*Vulgares*) to *Acaciæ* (*Gummiferæ*), and the *Albizziæ* to *Pithecolobium*, all with very different fruits; and the great diversities in the pods of some of the most natural groups, such as *Acacia* (*Phyllodineæ*), *Acacia* (*Gummiferæ*), *Inga*, *Mimosa*, &c., may be seen by a glance at Plates LXVI. to LXX. The modifications of the pod are, indeed, rarely structural, more frequently limited to outward form, consistency, or degree of dehiscence, characters resulting from diversity of development during enlargement as they approach maturity, affording no indication at or immediately after the period of fecundation; as, however, in some instances the characters derivable from the pod have acquired so great a degree of constancy as to be really available for the separation of more or less natural groups, it may be useful to pass in review such of these differences as have been, or may be, made use of with more or less of advantage.

The consistency of the pod, that is of the pericarp, thin and papery, thicker and coriaceous, woody, thick and spongy, or fleshy and succulent, has lost much of its supposed value, as almost all the varieties are observable in one or two species, at least, of the natural and well-defined genus *Acacia*; the fleshy or succulent pericarp upon which the genus *Inga* was originally founded, entailed the including in it many species which are more naturally distributed in the genera *Parkia*, *Stryphnodendron*, *Pithecolobium*, and even *Acacia*, and is by no means constant in *Inga* itself, the pod of several species of the sections *Leptinga* and *Bourgonia* being apparently dry and coriaceous; the succulent pod, however, is nearly general in *Inga*, *Parkia*, and *Stryphnodendron*, prevalent in *Pithecolobium*, very rare in *Acacia*, *Calliandra*, and *Piptadenia*, and never observed in *Albizzia*, *Mimosa*, *Leucæna*, or perhaps in any genus with albuminous seeds except *Stryphnodendron*.

With regard to dehiscence, or the separation of the two valves at maturity, the absolute difference between the dehiscent and nondehiscent species is not very defined. Generally indehiscent in *Inga*, usually, but by no means always, dehiscent in *Acacia*, *Piptadenia*, and *Albizzia*, very variable in *Pithecolobium*, the pod is, I believe, always

dehiscent in *Calliandra*, and in all the genera with albuminous seeds. The mode of dehiscence gives sometimes rather more available generic characters; for it appears to depend rather more upon internal structure. The obliquely elastic woody pods of *Pentaclethra* have been commented on by Oliver (Trans. Linn. Soc. xxiv. 415). The elastic dehiscence of *Calliandra* neatly characterizes a large group which was at first thought to be geographical as well as natural, having been supposed to be strictly limited to the warmer regions of America. Three or four species are now known to exist in tropical Asia; these, however, are all very distinct and but little-varying species, and all of very limited area, and may be set down as in all probability old races in the course of extinction, whilst the American races appear to be in the full vigour of life, multiplying, varying and spreading, with specific limits often as yet very ill-defined; and in future ages it may be expected that *Calliandra*, with its elastically revolute pod-valves and other characters, may become a more and more distinctly natural as well as geographical genus. A similar dehiscence, but accompanied by very different floral characters, is observable also in three species of *Acacia* (*A. nigricans*, *A. obscura* and *A. strigosa*), forming a small distinct group, with a very limited range, in the neighbourhood of King George's Sound, in South-west Australia, and in two or three northern species of the phyllodineous group, all of them apparently very local; the character is otherwise, as far as known, strictly confined to the *Calliandræ* of the true American type.

The closely united nerve-like margins of the two valves, persistent after the remainder has fallen away leaving a so-called *replum*, is eminently characteristic of the genera *Entada*, *Mimosa* (including *Schrankia*) and *Lysiloma*, and is not, as far as I am aware, to be met with in any other genus. It is, therefore, perhaps the most important character derivable from the fruit, and is almost always well marked when the pod can be observed at or near maturity. It is only in one or two of the small thick-fruited species of *Mimosa* that the margins appear sometimes to split with the valves at the apex of the pod; and in *Acacia Guachapelle*, H., B. et K., which I have transferred with some hesitation to *Lysiloma*, this margin has appeared to me to remain quite consolidated on the exterior or dorsal edge of the pod, but to split with the valves on the inner ventral or seminiferous edge. This requires, however, further investigation from perfectly ripe fruits, which have not been observed. The plant is, moreover, an exceptional one, a native of Guayaquil, with the habit and flowers of the more eastern tropical American *Pithecolobium Saman*, and of the Asiatic *Albizzia Lebbeck*, both with very different pods.

The articulate valves—that is, the separation either of the whole pod or of its deciduous valves within the persistent margin at maturity into distinct articles by a transverse division between each two seeds, has often been given as an absolute character sufficient to separate generically single species from all others, however closely allied in all other respects. This articulation is most marked in the majority of the species of *Mimosa*, but is by no means constant either in the whole genus or in some of the most natural groups into which it can be divided, whilst in some subordinate groups it wholly disappears, and even in some single species either of *Eumimosa Meticulosæ* or of *Habbasia Acantho-*

carpæ it appears to be vaguely defined or variable, depending perhaps in some measure on soil and weather. The articulation is less decided in the thick fleshy or hard pods of a few species of *Pithecolobium*, both from the Old and the New World, and of *Acacia concinna*, and in the flat pod of *Albizzia stipulata*, several of which species have been proposed as genera solely on account of this articulation. In *Entada* and *Plathymenia* it is limited to the endocarp, from which the valves fall away with the margin in *Plathymenia*, usually without it in *Entada*.

The twisting of the valves after dehiscence of many species of *Pithecolobium* and of the common *Adenanthera*, the development of a spongy or pithlike endocarp of *Prosopis*, the central longitudinal wings or angles on the valves of *Tetrapleura* and *Gagnebina*, the woody texture of the valves of *Xylia*, are all very secondary characters, more or less distinctly exemplified in scattered species of the very natural genus *Acacia*.

Of the nature and origin of the "pulp" which has been supposed to characterize the pods of *Inga*, *Pithecolobium*, *Prosopis*, *Stryphnodendron*, *Dichrostachys*, *Acacia farnesiana*, &c., I can find no good account; and it is very difficult to form an opinion from dried specimens. In most cases it appears to be a development of, or an exudation from, the endocarp or inner layer of the substance of the pericarp; in *Inga* it is described as a "pulpy arillus," which the dried fruits do not enable me to verify. In most, perhaps in all, species of the section *Unguis-cati* of *Pithecolobium*, the funicle is dilated into a fleshy arillus, often half enveloping the seed, but of a very different aspect from that of the remains of dried pulp often adhering to the seeds of *Inga*. That any real development of the funicle, however constant in the above-mentioned section of *Pithecolobium*, is not generally of much beyond specific importance in Mimoseæ, is evidenced by the extraordinary variety in the forms of the funicle in the Australian *Acaciæ*, noted in the specific descriptions in my Flora Australiensis.

In considering the systematic value of the characters by which the different Mimoseæ are to be distinguished, it is further necessary to take into account how far they may have been affected by geographical distribution. In this respect I need not here refer to such plant-forms as the arborescent, the herbaceous, the scandent and others, in respect of which the Mimoseæ afford no data different from those derived from plants generally, and which have been worked out by Grisebach, in as far as dependent on external physical conditions only; but there are a few others which may require a short mention, as resulting in some measure from genealogy, acting independently of or in combination with physical and other causes.

The phyllodineous development of the common petiole of the leaves, with a total arrest of the pinnæ and leaflets in all but the seedling and first following leaves, is an essentially Australian character, and yet cannot well be attributed to physical influences. It extends equally over the whole territory in its varied climates, spreading sparingly to the islands of the Pacific, but is limited in the Mimoseæ of these regions to the single genus *Acacia*. It is exemplified, however, in no less than 270 Australian species. There are no traces of the tendency in Asia or in Africa. In South America it reappears in a slight degree, but affecting a different group of the suborder. Two Brasilian species of *Mimosa* and an extratropical one of *Prosopis*, as also, if I was correct in the deter-

mination of a single small specimen in the Berlin Herbarium, a San-Domingo species of *Mimosa*, have the leaves reduced to single phyllodia. No peculiar connexion of the phyllodia with any local circumstances has been observed.

The simply instead of doubly pinnate foliage is, in the suborder, exclusively American, and definitely characterizes a large genus (*Inga* including *Affonsea*), without any trace of it in any other genus of American Mimoseæ, nor even in the nearest allied of Asiatic forms, no passage from the one to the other either in the same species as in *Gleditschia*, *Ceratonia* * or *Moldenhauera*, or in the different species of one genus as in *Cæsalpinia*, thus raising the character to the rank of a good generic one.

The general tendency of frutescent plants in stony deserts to degenerate into spinescent scrubby almost leafless shrubs, is exemplified also in a few Mimoseæ, such as some *Acaciæ* in Australia, *Dichrostachys* in Africa, *Prosopis* and *Mimosa* in extratropical South America, but without exhibiting any thing of a genetic character. The development, however, of prickles and of spinescent stipules appears to be influenced by genealogical as much as by physical causes. The prickles (aculei), whether scattered or infrastipular, are characteristic of groups of *Piptadenia*, *Mimosa* (including *Schrankia*) and *Acacia*, variously dispersed over America, Asia, and Africa, but have never found their way into Australia, and are unknown in all other genera of Mimoseæ. When hooked, they are particularly developed in scandent species, which they aid in supporting; but there are scandent species in other genera which entirely dispense with their aid.

There are three east-tropical Asiatic species of *Albizzia* (*A. Millettii*, *A. rufa*, and *A. pedicellata*), a genus otherwise absolutely without thorns or prickles, in which, however, a peculiar hooked appendage is often developed under the leaf, which hardens into a woody hook, and appears to partake more of the nature of a thorn than of an epidermal prickle, although its position bears no relation to any more developed organ in any other Mimosea, the infrafoliar prickles of a few species of Mexican or of African *Acaciæ* are, like the infrastipular ones, strictly epidermal. The species bearing these hooks are not reported as climbers, and are sometimes noted as arborescent; no such hooks are known in any other Mimoseæ; and the circumstances favouring their maintenance in these very few species, only observed in South China, Malacca, and Java, are as yet entirely unknown.

Spinescent stipules are met with in various groups, especially in the *Acaciæ Gummiferæ* and *Pulchellæ*, and a few *Phyllodineæ*, in a very few *Calliandræ* and *Pithecolobia*, never in *Mimosa*, *Albizzia*, *Inga*, nor in the smaller genera, and, as far as has been observed, are always independent of physical conditions. These spinescent stipules in the *Acaciæ Gummiferæ*, whether from tropical America, Africa, or Asia, offer the curious phenomenon of an extraordinary development of some of the pairs, or sometimes of nearly all of them, assuming the aspect of horns of cattle. Such hornlike enlargements are most general in dry hot regions; but as far as the information of collectors can be relied on, many of the specimens affected by them are from the richest moist forest-regions of tropical America. They never appear to affect the whole of the stipules of any one

* See Pasquale, Rendic. R. Accad. Sc. Naples, 1874, March.

bush, varying in degree of development in the several pairs of stipules of the same branch, but affecting special forms and tinges of colour, from an ivory-white to a livid purple, for each species. They are generally hollow, with a small opening in one horn of each pair leading to the cavity, which is continuous throughout, and, in America at least, are usually, like the swellings at the base of the leaves of some South American Melastomaceæ, in the stems of some South American Labiatæ, or Malayan Rubiaceæ, &c., tenanted by colonies of stinging ants, much to the annoyance of collectors. For careful observations as well as for speculations on the supposed relation of these abnormal developments to the preservation of the species as well as to the welfare of their tenants, I may refer to Belt's most interesting 'Naturalist in Nicaragua,' p. 218. I am not aware of any special attention having been paid to them in the Indian peninsula, in Arabia, or North-east Africa, where these productions abound; nor are we informed even whether they are there, as in America, occupied by ants. I know of no instance where any similar enlargement takes place in the spinescent stipules of the Australian *Acaciæ* of the *Phyllodineæ* or of the *Pulchellæ* groups, nor in those of *Pithecolobium*, section *Unguis-cati*, or of *Calliandra colletioides*, *C. geminata*, &c. Very much, therefore, has yet to be observed before we can be said to be well acquainted with the history of these productions; all that can now be stated generally is, that they appear to be the combined result of hereditary constitution, of soil and climate, and of the working of ants. What share each cause has had in the general effect remains to be ascertained.

The geographical dispersion of the more essential differences in character, such as the limited and indefinite number of stamens, the glanduliferous and eglandular anthers, the agglomeration and freedom of the pollen-grains, the albuminous and exalbuminous seeds, and even the succulent and dry, as well as the articulate and inarticulate pods, would tend to confirm that conclusion of the antiquity of these differences which we might derive from the consideration of their systematic importance, *i. e.* of their stability and definiteness; and that antiquity must have been remote enough for the differentiation to have taken place during a period previous to the geographical disruption of the race of Mimoseæ consequent on the change from a former to the present physical and geological configuration of the earth's surface. For of all the above pairs of distinctive characters both types have been developed in the Old World as well as in the American forms, and not very differently so. We only observe generally that definite stamens, albuminous seeds, and succulent articulate and indehiscent pods have been more favoured in the New than in the Old World, and are unknown in races of Australian birth except in a very few belonging to the north-eastern region and forming part of the Indo-Australian rather than of the strictly Australian flora; whilst the Old-World developments have been chiefly in the direction of the characters more or less specially distinctive of or connected with the genus *Acacia*.

Upon the principles commented upon in the foregoing notes, the Mimoseæ are conveniently divided for systematic purposes into the 29 genera, forming 3 tribes, as detailed in the latter portion of the present paper; but in considering, as I shall now proceed to do, their genealogy and geographical distribution, more natural grades of subordination

may be exemplified by distributing them into 7 tribes or collective genera, and 46 genera or subgenera, viz. :—

1. Pentaclethra, almost as near to Cæsalpinieæ (*Dimorphandra*) as to Mimoseæ proper. 2 species.

2. Parkia, also partaking of a Cæsalpinieous æstivation, but much nearer to Mimoseæ proper. 2 subgenera, 16 species.

3. Piptadenieæ. Definite stamens. No albumen. 7 genera or subgenera, 53 species.

4. Adenantheræ. Definite stamens. Albuminous seeds. Anthers usually glanduliferous. Pod usually succulent, spongy, or woody. 9 genera or subgenera, 39 species.

5. Eumimoseæ. Definite stamens. Albuminous seeds. Anthers usually without glands. Pod usually dry, thin or coriaceous. 6 genera or subgenera, 312 species.

6. Acacia. Indefinite stamens, all free, or the central ones united at the base. No albumen. 6 subgenera, 429 species.

7. Ingeæ. Indefinite monadelphous stamens. No albumen. 15 genera or subgenera, 408 species.

In the investigation of the history of the Mimoseæ thus constituted, the first point that strikes us is that we have fewer indications of great antiquity in their case than in that of the Compositæ or of the Cæsalpinieæ (to which *Cassia* belongs). We have but few well-marked species, of doubtful affinity, isolated genetically, none of those remarkable insular forms indicative of long geographical isolation. The generic or sectional races common to regions now widely separated are neither numerous nor varied; and the common or representative species in the New and the Old World are remarkably few. This may be in some measure owing to the tropical character of the suborder. If it be true that long periods of great, but gradual, refrigeration and of restoration of heat have followed each other on our globe, and that to such a degree as at one time to have almost extinguished tropical heat, or at another to have melted down arctic glaciers, in each case creeping on slowly from region to region, and forcing, as it were, the gradual migration of races that can endure a temperate or cool climate, they would have no such effect on plants requiring more extreme temperatures, and especially on those accustomed to extreme heat. If no place of refuge unaffected by the change were at hand they would simply perish; and their migrations, their actual presence in lands now separated by apparently insurmountable obstacles, can scarcely be explained but by the consideration of causes actually in operation, or else by the supposition of an ancient relative configuration of land and water very different from what it now is. How far this dispersion in the case of Mimoseæ can be attributed to the one or the other cause may best be considered by taking severally the known instances of species common to the New and the Old World.

We have in the first place a few species, such as *Pithecolobium dulce*, *Mimosa pudica*, *M. sepiaria*, &c., the history of whose introduction into the Old World from the New is modern and well authenticated, although they are now so abundant in many parts of the Old World as to be frequently sent by collectors and described as indigenous. These are only mentioned here to show the facility for colonizing shown by these and other species of the suborder.

Leucæna glauca, *Desmanthus virgatus*, *Neptunia plena*, and *Calliandra portoricensis*, might perhaps be added to the list of modern colonists from America into the Old World,

although the evidences of their transmission are not so positive as in the case of the two first-mentioned species.

The Mimoseæ really common to the New and the Old World, without any evidence of modern transportation, or any reasonable doubt as to their having been established in both hemispheres, are, I believe, only four—*Entada scandens*, *Neptunia oleracea*, *Mimosa asperata*, and *Acacia farnesiana*.

Entada scandens varies from a trailing shrub to a gigantic climber, well known for its enormous sabre-like pods. It is widely spread over tropical Asia, and especially abundant in some parts of tropical Africa, and is also said to be frequent in several of the West-Indian Islands, as well as in the Isthmus of Panama and other parts of Central America, but scarcely extends into South America, except perhaps in a few places along the northern coast. It is a very distinct though variable race, no other species being closely allied to it. The genus is common to South America and tropical and south-eastern Africa; the species most numerous in the latter continent, and amongst them are those which, upon the whole, approach the nearest to the *E. scandens*. It might be conjectured, therefore, that this species had its origin either in eastern tropical Africa, or in that extent of land, now submerged, which many naturalists suppose to have extended far to the eastward of tropical Africa; and it may at some time have been carried out to the West Indies, although no means of transport previous to the discovery of America have been suggested. The species is sufficiently prevalent near the coasts for its seeds to find their way into the sea; and the sea will certainly carry them (possibly with masses of sea-weed) to great distances. They are occasionally thrown up on the shores of Britain, and those thus cast up have been made to germinate; but this is only one of many instances of drifts having been brought by the gulf-stream from the West Indies to the North European coasts; none that I know of are recorded of drifts from Africa reaching the West Indies. This wide geographical disseverance of *Entada scandens* (of which *Gyrocarpus Jacquini* affords another instance) remains to be accounted for.

Neptunia oleracea is an aquatic plant whose floating stems root at the joints, and spread rapidly in any slow-running tropical river or large piece of fresh water into which they may have been introduced. It was found abundantly in tropical waters by the early botanical explorers of South America, as well as of tropical Asia and Africa. The genus has several species in extratropical North America, in tropical Asia, and in Australia; but these belong severally to three groups, distinct from the *N. oleracea*; the only species really nearly allied to it is the terrestrial *N. plena*, abundant in South America, but perhaps, as above mentioned, a colonist only in the Old World, where it is scarce. We might conclude, therefore, that *N. oleracea* is a species of South-American origin, carried over perhaps in comparatively ancient times by some of those agencies which are known to facilitate the dispersion of aquatic plants, although they have not yet been fully investigated.

Mimosa asperata is a very common weed, if such a word can be applied to a tall shrubby plant, over the greater part of South America, where it passes almost gradually into more than one allied species, and which is also the country of the whole group to which it belongs. It may therefore be concluded with but little hesitation that it is of

American origin; and yet its wide distribution over tropical Africa and the Mascarene islands, where it was found by early explorers in widely different localities, seems to show that it was already there before the discovery of America, and that in a form or variety which is precisely one of the commonest in South America. It cannot very reasonably be included among the remains of some primitive flora from which those both of Africa and South America have been derived; for in that case it would have followed the example of others which give evidence of such a common origin, and would have diverged into specially African varieties or representative species. We must therefore, upon such data as we as yet possess, come to the conclusion that, like the *Neptunia oleracea*, it has been carried over in early days from South America to Africa independently of human agency, although not enjoying the peculiar facilities for such transport exemplified in aquatic plants.

The dispersion of *Acacia farnesiana* is more difficult to explain. It is now very abundant in almost all countries enjoying a tropical or subtropical climate, both in the New and the Old World; but it has been so long cultivated for the scent of its flowers, and spreads so readily from cultivation, that it is in east tropical South America, as in Asia and Africa, most frequently recognized as a colonist only; but yet it is said to have every appearance of being really indigenous in the Indian archipelago, and perhaps in tropical Africa; and it was gathered by the early explorers in tropical Australia. Its real home, however, is most probably Western America. It ranges there from Chili to Mexico and Texas, varying considerably, and passing not only into the closely allied species or variety *A. cavenia* (which is exclusively American), but also sometimes scarcely to be distinguished from some forms of the *A. tortuosa* and even of *A. macracantha*, both from the same region; whilst in the Old World it departs but little from the common cultivated form, and has no very near allies, none nearer than the tropical African *A. Sieberiana*, which, however, is only connected with it through the American *A. macracantha*. *Acacia farnesiana* may therefore, as far as can be judged from the data before us, like *Mimosa asperata*, be set down as a colonist only in the Old World, although a very ancient one.

If, however, we may be justified in considering these few species of the tropical suborder Mimoseæ, now found to be identical in the New and the Old World in countries now so widely separated by apparently impassable barriers, as casual though remote colonists from the one to the other, as having passed from the one to the other under physical conditions not very different from those which now prevail, the case is very different with representative or nearly allied species. These, if we follow the principles I have adopted in my notes on *Cassia* and on Compositæ, or explained in some of my Addresses, must be set down as descendants of a common stock, which, in the course of ages, has become more or less modified in one or both of the now dissevered regions. As to what was this common stock, whether identical with one of the forms still existing in one of the regions, or more or less distinct from all, and what was its home, whether in any part of the present dissevered common area of its descendants, or in some land formerly in connexion with the different present areas, but broken up by subsequent geological changes,—these are questions which, from the scantiness of the data at our

command, must be in a great measure speculative or conjectural, but which may yet be deserving of a passing notice.

Under this head of representative Mimoseæ in the two hemispheres we may fairly include the following nine:—

America.	Old World.
PENTACLETHRA FILAMENTOSA. Common in North Brazil and Guiana, extending to Central America, and connected, though not very closely, with the Brazilian *Dimorphandræ*.	PENTACLETHRA MACROPHYLLA. Limited range in west tropical Africa, without any Old-World connexions.
PIPTADENIA RIGIDA. South tropical and subtropical Brazil and Paraguay, and closely connected with a series of tropical Brazilian species.	PIPTADENIA AFRICANA. West tropical Africa, extending perhaps across to the lower Zambesi, but without any newly allied Old-World species.
MIMOSA POLYANCISTRA and M. CERATONIA. West Indies and Central America, and closely connected with several species ranging from Brazil to Mexico.	MIMOSA NAMATA and M. RUBICAULIS. East India, the former (so near to the American species that one variety is scarcely distinguishable from *M. polyancistra*) almost limited to the Peninsula, the other with a wider range, and closely connected with a few species from tropical Africa, and especially the Mascarene islands (including Madagascar).
LEUCÆNA DIVERSIFOLIA. Tropical Mexico, and connected with several species from West Tropical America.	LEUCÆNA FORSTERI. South Pacific islands, from New Caledonia to Tahiti, without any near Old-World connexions.
ACACIA MACRACANTHA. West tropical America and West Indies, with several closely connected tropical American species from the same region, some with a wider range.	ACACIA SIEBERIANA. Western tropical Africa, with a limited range, the nearest Old-World connexions in South Africa, but not nearly so close as the American connexions of *A. macracantha*.
ACACIA LACERANS. Brazil. A distinct species, but rather more nearly connected with allied species of the same country than is the case with *A. Pervillei*.	ACACIA PERVILLEI. Madagascar. No Old-World species approaching it nearly so closely as the *A. lacerans*.
ACACIA PANICULATA and A. RIPARIA. Both with a wide range over tropical America, and connected with several other species common over a great part of the same area.	ACACIA PENNATA and A. CÆSIA. Both with a wide range over tropical Asia, and one, if not both, extending over tropical Africa, connected with two more local species, one from south-east Africa, the other from the Malayan archipelago.

In studying the above list, the first point which strikes us is the marked American character of seven out of the nine pairs of species. They are there surrounded by a numerous, flourishing, and widely diffused kindred, whilst in the Old World they are comparatively, or even absolutely, isolated and limited to small areas. A hasty conclusion might therefore class them with the identical species of the previous list as old colonists, distinguished only as having acquired their idiosyncrasy by a longer isolation. But a further consideration discloses a marked difference in the two cases. Although time and isolation are important elements in the modification of races, yet it requires something more to produce a change of specific character. Circumstances must have occurred to bring natural selection into play. A race which has acquired a prosperous stability by having settled into a constitution suited to the circumstances in which it is placed, will, if brought to colonize in a country offering similar conditions, most likely there also preserve its identity for an indefinite period, or become too slightly modified to be specifically distinguished. But it is different with a race gradually extending itself in different directions over bordering regions where physical or social conditions are more or less modified. In the former case, notwithstanding the innumerable,

although slight, variations produced in every generation, not one, either in the parent or in the adopted country, may succeed in superseding the typical form fixed through a long period of unchanged circumstances. But as this typical form gains a footing in new ground under new conditions, it may gradually become modified by natural selection at both extremities of its thus extended area. The divergencies thus established will probably, as I have on several occasions observed and specially exemplified in my *Cassia* paper and in my Address of 1870, be in different directions in the two new countries, however similar the external conditions may be in both. Two new species will be produced, all the more distinct if the typical form comes to disappear with the country which gave birth to it. Thus it is that we have representative species in distant regions having a common origin, but not derived the one from the other as in the case of colonists.

Returning now to the list, and keeping the above considerations in view, we may conceive that *Acacia Sieberiana* and *A. Pervillei* may have been colonists from America of very ancient date, which have become slightly modified from their typical forms, *A. macracantha* and *A. lacerans*, although even here we should have much doubt; and all the others suggest rather a common descent only from some typical race more or less distant from both its descendants. This places them in the same category as widely dissevered congeners, which we may now proceed to consider.

The following table exhibits such natural generic or subgeneric groups of Mimoseæ, as we find represented in both the New and the Old World, in their respective proportions and characteristic relations. The representative species of the last table are here again included; but the few identical ones which have, as it were, lost their nationality are passed over:—

Genera or Subgenera.	America.	Old World.
Pentaclethra	*P. filamentosa*, East tropical, 1 isolated sp. as above.	*P. macrophylla*, Africa, 1 isolated sp. as above.
Parkia	3 Brazilian sp. of the same group as the Old-World sp., 5 from North Brazil or Columbia, forming a rather distinct subgenus.	4 or 5 East Asiatic and Archipelago sp. (not all as yet sufficiently known), and 3 African sp. all of a subgenus represented in America. 1 from the Indian Archipelago, described as very different, but unknown to me. None from Australia nor from the Mascarene islands.
Entada	3 sp. 1 Brazilian, with the inflorescence of the African ones; 2 with a peculiar inflorescence, extending all across tropical America.	7 African sp., some of them well marked. None from Asia, Australia, or the Mascarene islands (except *E. scandens* of the identical table).
Piptadenia	33 sp., chiefly Brazilian, but a few extending westward to the Pacific: 24 belonging to the same section as the Old-World ones, 9 forming two sections unrepresented in the Old World.	4 species. 1 African, a chiefly western representative of an American one as above; 1 East Indian, apparently local (in Oude), with a slight affinity to a Columbian sp.; 1 Madagascar, very distinct; the 4th African, but insufficiently known to be certain of its genus. None in Australia.
Prosopis	12 or 13 sp., either western or northern and southern extratropical, forming two sections unrepresented in the Old World.	3 sp. 2 West Asiatic, scarcely tropical, 1 tropical African, those of each country forming a section distinct from the American ones. None in Australia or the Mascarene Islands.

Genera or Subgenera.	America.	Old World.
Neptunia	4 sp. (besides the identical one), 2 tropical and 2 northern extratropical.	3 sp. 1 from the Indian Peninsula, too distinct to be classed as representative of any American species; 2 Australian, still more distinct. None from Africa or the Mascarene Islands (except the identical one).
Desmanthus	9 sp. 2 widely-spread tropical and subtropical weeds, 7 northern extratropical and subtropical.	1 sp., Madagascar, very distinct from the rest of the genus. None in Asia, Africa, or Australia, except as modern colonists.
Mimosa (Rubicaules)..	About 15 species, spread over tropical America, the representative ones and their nearest allies chiefly from the West Indies and Central America. The whole genus, very abundant within and near the tropics, containing about 270 American sp., all (except the above 15 and the identical *M. asperata*) belonging to groups unrepresented in the Old World.	8 sp. The two representative ones Asiatic, the other 6 Mascarene or east tropical African; none from Australia or west tropical Africa, and no others of the genus in the Old World, except the identical *M. asperata*.
Leucæna	8 sp., all western tropical, or northern subtropical.	1 sp. South Pacific Islands; none in Asia, Africa, or Australia.
Acacia (Gummiferæ) Summibracteatæ.	9 sp., all western or West Indian.	4 sp., all African. 1 west tropical, and representative of an American one; 3 south extratropical.
—— Medibracteatæ..	2 sp., Mexican-Texan, resembling some of the Old-World species, but scarcely representative.	About 40 sp. 27 or 28 African, of which 2 northern extratropical, 9 southern extratropical, 16 or 17 tropical, 1 extending over east tropical Africa and west tropical Asia; 8 tropical Asiatic, 3 tropical Australian. No Mascarene sp.
—— Basibracteatæ..	5 sp., Mexican-Texan or Central American, all well marked.	3 sp. 2 tropical African, 1 East Indian Peninsula, all well marked. No Mascarene or Australian.
Acacia (Vulgares) ..	42 sp. About 24 Brazilian or Columbian, and most of them with an extended area; the remainder western or almost extratropical, north or south, with more limited areas; both groups occasionally representative of, or nearly allied to Old-World species; the western and the Mexican ones the most distinct. The genus contains also 2 sp. belonging to a group (Filicinæ) not spreading very far from Central America.	24 sp. 3 spread over tropical Africa and Asia, 7 confined to tropical Asia, 9 to tropical Africa, 4 to South Africa, 1 Mascarene. No Australian. The genus contains also nearly 300 sp. belonging to 3 Australian sections or groups, of which the Phyllodineæ alone are represented by 5 Polynesian and 1 Mascarene sp.
Calliandra	Nearly 100 sp., chiefly tropical, scarcely separable into distinct groups, many of them very variable, and some of rather extended areas, 2 or 3 found beyond the tropics north or south.	5 sp. 2 from Khasia, 1 from the Indian Peninsula, 1 (not certain as to the genus) from Ceylon, 1 from Madagascar, all of restricted area and specifically very distinct, although more or less allied to American forms. None in Africa or Australia.
Pithecolobium (Samanea) Subarticulatæ.	5 sp. Brazilian with 1 western, the section containing also 3 other groups (18 species) purely American, and the genus including 5 American sections with about 60 species.	4 sp. 1 from tropical Australia and the Archipelago, 1 from the Indian Peninsula and Ceylon, 1 from Madagascar, 1 from tropical Africa, all specifically very distinct, but allied to the American ones. No other Old-World group of the same section, but one Old-World distinct section of the genus, with 22 species, of which 3 tropical Australian, the others tropical Asiatic, chiefly from the Archipelago, some with a wide East-Indian range. No Mascarene or African species of this Old-World section.

The following genera are limited to one of the two hemispheres :—

Genera.	America.	Old World.
Elephantorhiza	.....	2 sp., extratropical or subtropical South Africa, near the *Entadæ* of the same country.
Plathymenia	2 sp., Brazil, approaching on the one hand the African *Entadæ*, on the other the Brazilian *Piptadeniæ*.	
Xylia	.....	1 sp., East India and the Archipelago, with no immediate affinities.
Stryphnodendron	9 sp., Brazil and Guiana. No close affinity except a general one with the 4 following Old-World genera.	
Tetrapleura	.....	3 sp., tropical Africa.
Adenanthera	.....	3 sp. 2 tropical Asia, 1 tropical Australia.
Gagnebina	.....	1 sp., Mascarene.
Xerocladia	.....	1 sp., South Africa.
		The above four genera distinct, but generally allied to *Stryphnodendron* and *Prosopis*.
Dichrostachys	.....	7 sp. 4 African, tropical or southern subtropical, 1 Mascarene, 1 Indo-Australian, 1 Australian tropical. A distinct genus, generally allied to *Prosopis* and *Neptunia*.
Schrankia	6 sp., of which 2 Brazil to Columbia, 4 Northern, Extratropical, or Central, all forming more appropriately an American section of *Mimosa* than an independent genus.	
Lysiloma	10 sp., Columbian, West Indian, and Mexican, quite unrepresented in the Old World.	
Albizzia	.....	40 sp., Africa, Mascarene Islands, Asia and Australia, slightly corresponding to the American section *Ortholobium* of *Pithecolobium* (2 Mexican sp.).
Enterolobium	5 sp., Brazil to West Indies, properly a section of *Pithecolobium*.	
Serianthes	.....	5 sp. 1, Malacca and the Archipelago; 4, islands of the South Pacific.
Archidendron	.....	2 sp., tropical Australia.
		The last 2 genera perhaps sections of *Pithecolobium*.
Inga	About 140 sp., spread over all parts of tropical America, 1 or 2 sp. only crossing the tropics north or south.	
Affonsea	3 sp., Brazil. Properly a section of *Inga*.	

The distribution of the species in the two hemispheres may be generally summed up in the following table, in which I have not separated the American regions from each other, as being too much blended together, without definite limits; but I have been able to distinguish 5 Old-World regions, with but very few overlapping species which have to be repeated in two or more columns.

	Genera and Subgenera.	America.	Africa.	Mascarene Islands.	Asia.	Polynesia.	Australia.	Total.
	Pentaclethra	1	1	..	..	..	..	2
	Parkia Euparkia	3	3	..	6	..	..	19
	„ Paryphosphæria	7	..	..	..	..	..	
Piptadenieæ.	Entada	4	8	..	1	..	..	11
	Elephantorhiza	..	2	..	..	..	..	2
	Plathymenia	2	..	..	..	..	..	2
	Piptadenia Eupiptadenia	25	2	1	1	..	..	38
	„ Pityrocarpa	5	..	..	..	..	..	
	„ Niopa	4	..	..	..	..	..	
	Xylia	..	..	..	1	..	..	1
Adenantheræ.	Stryphnodendron	8	..	..	..	..	..	8
	Adenanthera	..	..	..	3	..	1	4
	Tetrapleura	..	3	..	..	..	..	3
	Gagnebina	..	..	1	..	..	..	1
	Prosopis Algarobia	13	..	..	..	..	..	16
	„ Anonychia	..	1	..	..	..	..	
	„ Adenopis	..	..	..	2	..	..	
	Xerocladia	..	1	..	..	..	..	1
	Dichrostachys	..	4	1	1	..	2	7
Mimoseæ.	Neptunia	5	1	1?	2	..	2	8
	Desmanthus	9	..	1	..	..	..	10
	Mimosa Eumimosa	130	..	..	..	..	..	278
	„ Habbasia	141	3	5	2	..	..	
	Schrankia	6	..	..	..	..	..	6
	Leucæna	8	..	..	..	1	..	9
	Acacia Phyllodineæ	..	..	1	1	4	271	432
	„ Botrycephalæ	..	..	..	..	..	10	
	„ Pulchellæ	..	..	..	..	..	8	
	„ Gummiferæ	17	35	..	9	..	4	
	„ Vulgares	42	22	1	9	..	..	
	„ Filicinæ	2	..	..	..	..	..	
Ingeæ.	Lysiloma	10	..	..	..	..	..	10
	Calliandra	95	..	1	4	..	..	100
	Albizzia	..	21	5	18	6	5	52
	Pithecolobium Unguis-cati	12	..	..	..	..	..	108
	„ Clypearia	..	..	..	19	1	3	
	„ Abaremotemon	18	..	..	..	..	..	
	„ Samanea	24	1	1	2	..	1	
	„ Orthologium	2	..	..	..	..	..	
	„ Caulanthon	16	..	..	..	..	..	
	„ Chloroleucon	6	..	..	..	..	..	
	Enterolobium	5	..	..	..	..	..	5
	Serianthes	..	..	..	1	4	..	5
	Archidendron	..	..	..	..	..	2	2
	Inga	140	..	..	..	..	..	140
	Affonsea	3	..	..	..	..	..	3

Tribes.	America.	Africa.	Mascarene Islands.	Asia.	Polynesia.	Australia.	Total.
Pentaclethra	1	1	..	..	..	..	2
Parkia	10	3	..	6	..	..	19
Piptadenieæ	40	12	1	3	..	..	54
Adenantheræ	21	9	2	6	..	3	40
Mimoseæ	299	4	7	4	1	2	311
Acacia	61	57	2	19	4	293	432
Ingeæ	331	22	7	44	11	11	405
Total Mimoseæ	763	108	19	82	16	309	1263

In considering the data supplied by the above tables, the most striking feature is the great American predominance not only of the whole order, but, if we deduct those Australian and African *Acaciæ* which have less of a tropical character or are quite extratropical, of every tribe and of the great majority of the genera and principal subgenera. *Piptadenia*, *Prosopis*, *Mimosa*, two sections of *Acacia*, five sections of *Pithecolobium*, and *Inga*, with a few of their minor satellites, show each a large number of American species, mostly of a comparatively extended area and rich in varieties; whilst Asia has only *Albizzia*, one section (*Clypearia*) of *Pithecolobium*, and in a less degree two sections of *Acacia*, exhibiting the same character; and Africa is still further deprived of *Clypearia*.

This high degree of recent luxuriance and prosperity of American races, however, can by no means be relied upon as evidence as to local origin, or even as to comparative remoteness of antiquity; for that may rather be sought for where there are the greatest number of highly differentiated monotypes or oligotypes of limited areas and fixed characters, exhibiting the last remains, as it were, of expiring races; and these are undoubtedly to be met with chiefly in the Old World, in the first place in East Africa and the Mascarene Islands, and secondly in the Malayan archipelago. But this question of what might have been the original birthplace of Mimoseæ is involved in too much obscurity, and the few conjectures that might be hazarded are connected with too great a variety of disputed geological conditions and histories to be here discussed. It may suffice to observe that there is every reason to suppose that the seven tribes, and a few at least of the genera or subgenera, had been differentiated and spread over the common area whence the tropical floras of America and Africa had been derived, for a sufficient time before its disruption or disappearance to allow of their being all communicated to both the regions now so widely dissevered. A few words may also be devoted to the consideration of how the several races have subsequently prospered in each of the hemispheres, as far as can be judged of by the present aspect of what still survives. Of the several races which have entirely perished in the one or the other hemisphere, the records are, I believe, as yet too few and imperfect to form the basis of any satisfactory conclusions.

Pentaclethra is monotypic in both hemispheres, inhabiting the moist forest regions of North Brazil and Guiana in America, and of west tropical Africa in the Old World. The two species are in the present day generically isolated and specifically distinct. Neither of them shows any tendency to variability, nor to any extension of area; and both may be set down as expiring races. They may also be connected in their origin rather more with Cæsalpineæ (Dimorphandreæ) than with Mimoseæ, and perhaps with some of those races which, like *Cassia* (*Pictæ*), had long left representatives in America, in Africa, and in Australia. If the nearest connexion, *Dimorphandra*, is purely American, the next step, *Erythrophleum*, is common to Africa and Australia.

Parkia has the geographical character of *Pentaclethra*, but more extended. It is another of the old genera derived from the common stock of Cæsalpinieæ and Mimoseæ, but much nearer to the latter. It is still luxuriating in the moist forest regions of both the New and the Old World. It has produced some 4 or 5 species in the Malayan

archipelago and neighbouring Asiatic districts (not extending, however, to Australia), and about 3 African ones, all nearly allied, variable, and of rather extended range. In America it has gone further. Besides 3 Brazilian species, not very far removed though specifically distinct from the Old-World ones, it has developed into a mere local subgenus *Paryphosphæria*, of which 5 species are known from North Brazil, Guiana, or Columbia. I say nothing at present of a few imperfectly described Malayan-archipelago species, such as *P. singularis* and *P. sumatrana*, Miq., of which I have seen no specimens, as it appears very uncertain whether they really belong to the genus.

The *Piptadenieæ*, or Mimoseæ with definite stamens, exalbuminous seeds, and almost always glanduliferous anthers, including 7 genera or subgenera, have the geographical character of the order—39 American species in 5 genera or subgenera, of which 3 are endemic, 12 African in 3 genera, of which 1 endemic, 1 Mascarene species, and 3 Asiatic in 3 genera, of which 1 endemic. Of the 5 (or perhaps, rather, 4) genera, *Piptadenia*, belonging to the moist forest regions, in its typical and what may be presumed to be the nearest to the original form, has representatives in all four countries—in America 24 species, chiefly east of the Andes, but with 1 or 2 extending westward to the Pacific, several of them with a wide range as well as variable, besides 9 species belonging to two distinct genera, but with similar specific wide range and variability, especially the *Niopæ*, in Africa 2 species (one of them imperfectly known), in the Mascarene islands 1, and in Asia 1, all of definite character and limited area. The genus may thus well be classed amongst the races in the full tide of prosperity in America, but expiring in the Old World. *Entada*, after deducting *E. scandens*, which is identically luxuriant in Asia and Africa, and to a certain degree in America, has a more African character, having there developed 7 endemic species, and only 3 in America. The latter belong to the same forest region of North Brazil and Guiana as the majority of the *Piptadenieæ*, whilst in Africa the genus is less exclusively tropical, 2 species extending southward to the Natal district, where also has arisen the endemic allied genus or subgenus *Elephantorhiza* with 2 (or 3 ?) species. *Plathymenia* is an endemic Brazilian genus of 2 species, closely connecting *Piptadenia* with *Entada*; and *Xylia* is a very distinct monotypic genus, which, if we neglect the above-mentioned identical *Entada scandens*, is the sole survivor of the ancient race of Piptadenieæ in tropical Asia, but is there luxuriant, having maintained an extended range from the Peninsula to the Malayan Archipelago. Like *Pentaclethra* and *Parkia*, the tribe, if it ever spread to Australia and Polynesia, has there left no traces of its existence.

The only exceptional species of the tribe without glands to the anthers are two American *Niopæ*, in other respects closely resembling two genuine species of the subgenus, and all four showing an approach in habit, though none in any other essential character, to some species of *Acacia*.

Adenantheræ, or Mimoseæ with definite stamens, albuminous seeds, and almost always glanduliferous anthers, still show an American preponderance, but in a less degree; the forms are more generically diversified though still specifically variable, and the characters much less tropical. In America we have 21 species in 2 genera or subgenera, both endemic; in Africa 9 species in 4 genera or subgenera, of which 3 endemic;

in the Mascarene islands 2 species in 2 genera, of which 1 endemic; in Asia 5 species in 3 genera or subgenera, of which 1 endemic, and in Australia 3 species in 2 genera. *Stryphnodendron*, with 8 species, is the only genus of the tribe which luxuriates in the moist tropical forests east of the Andes, with systematic as well as geographical characters showing an approach to the Piptadenieæ, but with the albuminous seeds and thick scarcely dehiscent pods of *Prosopis* and its allies. *Algarobia*, including *Strombocarpa*, the American subgenus of *Prosopis*, has a very different geographical constitution from any of the preceding Mimoseæ. Scarcely known east of the Andes, and certainly absent from the forest regions of Brazil and Guiana, it has one tropical species so variable that it has been divided into from two to about a dozen supposed species, extensively planted, but appearing to have a really indigenous range of remarkable extent, from extratropical Chili along the tropical Andes and coast of the Pacific to Mexico and the West Indies. 11 other American species are extratropical or nearly so, southern or northern, none of the Argentine or Chilian ones absolutely identical with the Mexican or Texan, but sometimes closely representative. *Adenopis*, the Asiatic subgenus of *Prosopis*, with 2 species, extends from the western extratropical districts to the Indian peninsula; *Anonychia*, the African monotypic subgenus, is more tropical, but affects rather the desert than the forest region. *Adenanthera*, 3 species from tropical Asia and Australia, and *Tetrapleura*, 3 tropical African species, are, like the American *Stryphnodendron*, inhabitants of the forest. *Xerocladia* is a single strongly differentiated South-African extratropical species; *Gagnebina*, a single Mascarene species. The more tropical *Dichrostachys* has a wide range with more variable species, but it is still more abundant in the open regions of the *Acaciæ* (*Gummiferæ*) than in the moist forests. We have 4 African, 1 Mascarene, 1 Asiatic and 2 Australian species, those of each country quite distinct, although the two nearest allied, the wide-spread and variable African *D. nutans* and the Indian-peninsula *D. cinerea*, may be considered as representative.

This tribe well illustrates the fact that as the character becomes less tropical, the specific divergences in the two hemispheres are more marked; not only have representative species disappeared, but there is no subgenus of Adenantheræ common to the New and the Old World—one amongst other grounds for conjecturing that Mimoseæ originated in a tropical region, and have only here and there produced races with a constitution sufficiently hardened to flourish and multiply in more temperate climates.

The only exceptional species of the tribe without glands to the anthers are two species of extratropical South American *Prosopis*, in other respects showing an approach, rather in habit than in character, to some species of *Mimosa* from the same region.

The tribe *Eumimoseæ*, or Mimoseæ proper with definite stamens, albuminous seeds, almost always eglandular anthers, and the pod very rarely thick or fleshy, has its American character more decided than any other. The 6 genera or subgenera are all American, with about 300 species, mostly tropical, some of them of wide range and highly variable, others very local and distinct, and a few extratropical, both north and south; whilst the Old World has but 13 species, of which 2 are identical and 2 closely representative of American ones. In America one genus, *Leucæna*, and 2 or 3 subordinate groups of *Mimosa*, with about half a hundred species, are western West-Indian or extra-

tropical, with limited areas; but the great mass of the species are either widely spread over tropical America, chiefly east of the Andes, or are more local in southern Brazil and adjoining districts. In Africa, besides 2 species, an aquatic *Neptunia* and a *Mimosa*, identical with American ones, there are only 2, both belonging to the *Mimosæ* (*Rubicaules*), and almost representative of American ones. The Mascarene islands have a very distinct *Desmanthus*, which might almost rank as a subgenus, and 5 species of *Mimosa*, all belonging to the same group of *Rubicaules*, but some of them rather more distinct than the Asiatic and African ones. In Asia, besides the aquatic *Neptunia* identical with the African and American one, there is a rather distinct endemic species of that genus, and 2 of *Mimosa* (*Rubicaules*), both closely representative of American ones. In Polynesia there is a *Leucæna*, distinct from, but not very far removed from, an American one, and the only Old-World representative of that West-American genus. In Australia the sole members of the tribe are 2 species of *Neptunia*, forming a section distinguished from the rest of the genus by the reduction of the stamens to a single instead of a double series, a character not observed in any other Old-World Mimoseæ, and repeated only in the American subgenus *Eumimosa*.

As a whole, the *Eumimoseæ*, although evidently very early established in the Old World, with the presumably Mascarene or African centre of the suborder, have with difficulty maintained their ground there, whilst in America they have prospered and acquired enormous dimensions. The few exceptional species of the tribe, with more or less prominent glands to the anthers, belong to the small scattered genus *Neptunia*, which, however, in other respects, is closely connected with *Mimosa*.

The *Acacia* tribe differs from all the preceding in its comparative prosperity in the Old World, and especially in its wonderful development in the southern hemisphere, in Australia, and to a certain degree in South Africa; but in both cases the progress seems to have been from the tropics southward, as there is no trace of the genus in the extreme south of America, nor in New Zealand, nor any connexion between the extratropical African and Australian species. The former belong to a widely spread tropical subgenus, the latter to three specially Australian subgenera, of which one only has remained sparingly persistent in the Mascarene, Malayan, or South Pacific islands. I would observe that, geographically, I here speak of these divisions of *Acacia* as subgenera, because they appear to me, in a genealogical sense, to have the same importance as the subgenera of *Mimosa*, *Pithecolobium*, and others, although, being distinguished by vegetative characters only (chiefly foliage and inflorescence), to the utter neglect of numerous floral or carpological differences, they are, for systematic purposes, under the rules usually followed, treated as series only, with adjective instead of substantive names.

The three extra-Australian subgenera are all American; one, a very small one, the *Filicinæ*, is endemic and of limited range in Central America, Mexico, Texas, and the West Indies; but its two species appear to be abundant within their areas, and so variable as to have been described under some eight or ten different names. The American preponderance is also maintained in the *Vulgares*, with 42 species, the majority of which are tropical, with their chief seat in the forest regions east of the Andes, some of them widely spread, very variable, and having Old-World representatives. But there

are also western or extratropical species, north and south, of limited areas and very definite character, remnants of ancient races now evidently expiring. In the third extra-Australian subgenus, the *Gummiferæ*, the circumstances have changed; it is at once less tropical and less American. Only 14 species are known in the New World to 47 in the Old; and those 14 are either Western, West-Indian, or extratropical north and south. Not one (except the generally introduced *A. farnesiana*) is to be met with in tropical South America east of the Andes, although some, within their areas, appear to be abundant and variable.

In Africa the *Acaciæ* constitute more than half the whole number of the Mimoseæ of that continent, and form a very prominent feature in the desert landscape of the dry districts both within and south of the tropics, extending in some places northward to the Mediterranean, and eastward, connected through Arabia with Western India. They belong to the two above-mentioned American and Asiatic subgenera *Vulgares* and *Gummiferæ*. Of the former, 22 species (to the American 42) include some forest races of wide range, representative both of Asiatic and American ones. The African *Gummiferæ*, on the other hand, far surpass those of any other region, comprising at least 35 species, often wide-spread, some very variable, and two at least apparently identical with West-Asiatic ones, but others again local and definite. From the Mascarene islands I only know of 2 species of *Acacia*; one, belonging to the *Vulgares*, is remarkable as being closely representative of the Brazilian *A. lacerans*, and much further from any African or Asiatic species; the other, *A. heterophylla*, is an extreme outlying species of the Australian subgenus *Phyllodineæ*, and closely representative of the extreme outlying species in an opposite direction, the *A. Koa* of the Sandwich Islands. Asia has 19 species of *Acacia*, 9 each of the African and American subgenera *Vulgares* and *Gummiferæ*, and some of them closely representative of species from either continent; the remaining one, *A. Mangium*, one of the *Phyllodineæ* from Amboyna, is unknown to recent botanists; but if Rumphius's accounts are correct, it must be closely allied to, if not identical with, a North-Australian species. Polynesia, from New Caledonia to the Sandwich Islands, presents us with 4 species, all belonging to the same Australian subgenus *Phyllodineæ*, and nearly allied to North-Australian species. Whether the above six extra-Australian *Phyllodineæ* have migrated from Australia, or whether they are the persistent remnants of the race in its ancient home, we have no means of judging; but conjecture and analogy would lead to the latter conclusion.

It is in Australia itself that the genus has met with the largest development, having flourished beyond all precedent, and rivalling, or even surpassing in number the *Mimosas* of America. Of 393 species, 4 only, including the ubiquitous *A. farnesiana*, belong to the generally spread *Gummiferæ*, but appear to be very local in North Australia; the remainder are essentially Australian, 18 forming two small subgenera purely endemic; and no less than 271 are *Phyllodineæ*, many of them very variable and widely spread, others local and definite, the whole subgenus bearing a conspicuous part in the arboreous and frutescent vegetation of almost every part of Australia and Tasmania. Originating probably in some Mascarene or Malayan region, where it has left, as above mentioned, such very few traces, it has multiplied its forms with the greatest profusion,

spreading southwards till stopped by the ocean, which it has been unable to cross even to Norfolk Island and New Zealand.

The *Ingeæ*, or Mimoseæ with indefinite monadelphous stamens, are exclusively tropical, and show a very great American preponderance, although a few races also have prospered in the Old World; and the two hemispheres have very little in common. There are no identical or closely representative species; and even the genera or subgenera are mostly distinct. America has 330 species in 11 genera or subgenera, of which two only are slightly represented in the Old World, and the latter has 78 species, of which only 9 are allied to American forms, the remaining 69 forming 4 genera or subgenera unrepresented in the New World.

Of the American genera, *Lysiloma* alone, with 10 species, is limited to the western tropics or West Indies; the other 10 genera or subgenera ranging generally over tropical America, but specially abundant in the forest regions as well as in the Brazilian campos east of the Andes. The Old-World Ingeæ are also mostly forest inhabitants. *Albizzia*, with 40 species, is generally spread over the whole tropical region, with one species exceptionally established in extratropical Australia. *Clypearia*, with 22 species, and *Serianthes*, with 5, are limited to the Indo-Australian tropical region, the three genera including many variable races of extended range. *Archidendron* is exclusively Australian, with 2 species of limited areas. The 5 Asiatic or Mascarene *Calliandræ* and the 4 Asiatic Mascarene or African *Samaneæ*, are quite local and definite in character, whilst their numerous American congeners are remarkable for their variability and wide dispersion.

Inga itself, including *Affonsea*, 142 species, is remarkable for its simply, not doubly pinnate leaves, a character otherwise unknown among Mimoseæ, and in that suborder developed in America only; for the Indian bifoliolate *Calliandra cynometroides* must probably be noted as a reduction of a doubly compound leaf to its simplest elements of 2 unifoliolate pinnæ, not as a reduction of a simply pinnate leaf to a single pair, although the double articulation of the very short petiole is not evident, as in the corresponding American bifoliolate *Calliandra hymenæoides*.

With regard to the local distribution of Mimoseæ in each of the several continents, the subject is too closely connected with the general flora of each, and therefore too large to be treated of on the present occasion; I would only add a few words on the northern and southern extension of the suborder beyond the tropics.

We have seen that in America the northern and southern extensions exemplified in the genera *Prosopis*, *Mimosa*, and *Acacia* have taken place in those groups only which are, under the tropics, restricted to the western margin of the continent, a region where the mountain-chain and the adjoining sea have allowed a certain continuity of physical conditions still to exist, a continuity which may well have been much greater during former periods. As a result, the new races produced north and south, although disconnected in character as well as in area, have in many instances remained closely representative; and this is in accordance with what has been pointed out in many other classes of plants. In the Old World, however, as I have on other occasions observed, the ranges of mountains and impassable deserts and seas run much more east and west,

disconnecting more completely the northern and southern temperate regions. The extension therefore of Mimoseæ, as of other races of plants northward and southward, has been quite independent. In the Adenanthereæ, for instance, the Persian and Oriental *Prosopides* they have produced in the north have no connexion with the extratropical *Dichrostachydes* and *Xerocladia* developed in the south; even the few *Acaciæ* (*Gummiferæ*) which may have passed the northern tropical line are by no means representative of those of the Cape Colony, whilst the extraordinary luxuriance of the Phyllodineous and other Australian races of *Acacia* have nothing to correspond with them in extratropical Asia.

I cannot quit the consideration of dissevered representative races without alluding to an instance which it is quite out of my power to account for. The connexion of the tropical flora of North-east Australia with that of the Malayan archipelago and Eastern Asia generally, is exemplified in a large number of Orders, genera, and species; but then this Indo-Australian flora is strictly limited to the north-eastern quarter of Australia, or at most, in a very few cases, extends further down the east coast, and is always observed to be very remote from that of the south-west; and yet in the genus *Albizzia* we have two species so closely allied as to leave doubts whether they ought really to be regarded as specifically distinct, and together perfectly isolated from any other forms assumed by the genus; and yet the one, *A. montana*, inhabits the mountains of Java, whilst the other, *A. lophantha*, is limited to extratropical South-west Australia. The other spicate *Albizziæ*, chiefly New Caledonian, are very different in an essential character, the shape of the seed, as well as in many other respects.

The conjectural conclusions hazarded from the above considerations may be summed up as follows:—

That Mimoseæ originated in some ancient warm country, whence they were enabled to spread gradually over the various tropical regions they now occupy.

That, before the disruption or disappearance of their original country, they had so far become differentiated as to have established the majority, but by no means all the genera, subgenera, or other larger groups we can now distinguish.

That since their original disseverance into areas separated by obstacles insurmountable under ordinary circumstances, they have by natural selection established new races of higher or lower grades, more or less local, some of which have been enabled to spread into more temperate regions, very sparingly in the northern, more successfully in the southern hemisphere.

That in the New World, where the northern and southern temperate regions are or have been connected by cool mountain-ranges, the northern and southern extensions have been more or less connected, resulting in more or less representative northern and southern races, whilst in the Old World the northern and southern extensions have been quite independent, with very dissimilar results.

That the constitution of some races has been favourable to colonization, which had in a few cases taken place in prehistoric times, by means which we can only vaguely conjecture, but which in more recent days has been much more frequent in consequence of the facilities afforded by human intercourse and commerce, and that to these causes

may be referred the absolute identity of a few tropical species in the New and the Old World.

I now proceed to the enumeration of the genera and species of Mimoseæ more or less known to me, with short diagnoses of the more essential distinctive characters, referring, for more details as to genera, to our 'Genera Plantarum,' vol. i. pp. 462 and 588, and, as to species, to the various works quoted under each. I have, however, given the post-Linnean synonymy as complete as I have been able to ascertain it, and added fuller descriptions to the several species now first established as new.

Conspectus Generum.

Tribus 1. Parkieæ. Calycis dentes brevissimi imbricati.

1. Pentaclethra. Stamina 5, staminodia 5, 10 v. 15. Spicæ elongatæ. Legumen lignosum, elastice dehiscens.—*Africa, America.*

2. Parkia. Stamina 10. Capitula densissima, globosa v. clavata, floribus inferioribus neutris staminodiis 10. Legumen carnosum, indehiscens.—*America, Africa, Asia.*

Tribus 2. Piptadenieæ. Calyx valvatus. Stamina petalis numero dupla, antheris sæpissime glanduliferis. Albumen 0.

3. Entada. Legumen planum, membranaceo-coriaceum v. lignosum, valvis intra marginem integrum persistentem transverse articulatis, endocarpio circa semina persistente ab exocarpio secedente. Flores spicati.—*America, Africa, Asia.*

4. Elephantorhiza. Legumen planum, membranaceo-coriaceum, valvis a margine integro persistente secedentibus indivisis, endocarpio integro ab exocarpio secedente. Flores spicati.—*Africa australis.*

5. Plathymenia. Legumen planum, membranaceo-coriaceum, exocarpio continuo bivalvi, endocarpio solo in articulos 1-spermos secedente et circa semina persistente. Flores spicati.—*Brasilia.*

6. Piptadenia. Legumen planum, membranaceum v. coriaceum, 2-valve, valvis indivisis, rarius subindehiscens. Flores spicati v. globoso-capitati.—*America, Africa, Madagascaria, Asia.*

7. Xylia. Legumen planum, crassum, lignosum, 2-valve. Semina transversa. Flores globoso-capitati.—*Asia.*

Tribus 3. Adenantherеæ. Calyx valvatus. Stamina petalis numero dupla, antheris sæpissime glanduliferis. Semina albuminosa. Legumen crassum.

8. Stryphnodendron. Legumen subcarnosum, vix v. non dehiscens, intus inter semina septatum. Flores spicati.—*Brasilia, Guiana.*

9. Adenanthera. Legumen elongatum, sæpius incurvum, 2-valve. Semina crassa, coccinea v. bicolora. Flores laxe spicati, sæpius pedicellati.—*Asia et Australia tropica.*

10. Tetrapleura. Legumen oblongum, elevato-tetragonum v. 4-alatum, indehiscens. Flores spicati.—*Africa tropica.*

11. Gagnebina. Legumen oblongo-lineare, plano-compressum, ad margines membranaceo-alatum. Flores spicati.—*Ins. Mascarenses.*

12. Prosopis. Legumen crasso-compressum v. subteres, exalatum, rectum tortum v. spirale, coriaceum v. indurato-spongiosum, indehiscens, intus inter semina septatum. Flores spicati v. rarius capitati.—*America, Africa, Asia tropica et subtropica.*

13. Xerocladia. Ovarium 1-ovulatum. Legumen parvum, curvum, compressum, indehiscens, monospermum. Capitula globosa.—*Africa australis.*

14. Dichrostachys. Flores inferiores spicæ cylindraceæ neutri, staminodiis elongatis. Legumen durum, crassum, indehiscens.—*Asia, Africa, Australia tropica.*

Tribus 4. EUMIMOSEÆ. Calyx valvatus v. pappiformis v. 0. Stamina petalis numero æqualia v. dupla, antheris (excepta *Neptunia*) eglandulosis. Semina albuminosa. Legumen sæpius tenue v. coriaceum. Flores inferiores in generibus tribus prioribus interdum neutri.

15. NEPTUNIA. Legumen planum, oblique oblongum, a stipite deflexum, membranaceo-coriaceum, 2-valve. Herbæ suffruticesve diffusæ v. natantes, capitulis globosis.—*Orbis utriusque regiones calidiores.*

16. DESMANTHUS. Legumen lineare, rectum v. falcatum, angustum, membranaceo-coriaceum, 2-valve. Semina longitudinalia v. obliqua. Herbæ suffruticesve rarius frutices, capitulis globosis.—*America borealis et inter tropicos utriusque orbis.*

17. MIMOSA. Leguminis valvæ integræ v. articulatæ a replo persistente secedentes eoque latiores. Habitus varius. Flores spicati v. capitati.—*America, Africa tropica, Asia tropica.*

18. SCHRANKIA. Leguminis linearis tetragoni valvæ integræ a replo persistente secedentes eoque angustiores. Herbæ suffruticesve aculeati, capitulis globosis.—*America borealis et tropica.*

19. LEUCÆNA. Legumen (*Acaciæ*) lato-lineare, planum, membranaceo-coriaceum, 2-valve. Semina transversa. Arbores fruticesve elatiores, capitulis globosis.—*America tropica orientalis, una specie in utroque orbe inquilina.*

Tribus 5. ACACIEÆ. Calyx valvatus, rarius 0. Stamina indefinita, libera v. interiora basi brevissime connata. Albumen 0.

20. ACACIA. Legumen varium. Arbores fruticesve floribus spicatis v. capitatis.—*America, Africa, Asia calidior, Australia.*

Tribus 6. INGEÆ. Calyx valvatus. Stamina indefinita, basi in tubum connata. Albumen 0.

* *Folia bipinnata.*

21. LYSILOMA. Leguminis recti plani valvæ a margine persistente secedentes. Flores capitati v. rarius spicati.—*America tropica occidentalis.*

22. CALLIANDRA. Leguminis recti v. leviter falcati basi angustati valvæ ab apice ad basin elastice dehiscentes.—*America calidior, in Asia tropica et Madagascaria rarior.*

23. ALBIZZIA. Legumen rectum, planum, lato-lineare, tenue, valvis per dehiscentiam nec elasticis nec contortis. Arbores fruticesve floribus capitatis v. spicatis.—*Asia, Africa, Australia.*

24. PITHECOLOBIUM. Legumen compressum, coriaceum crassum v. subcarnosum, arcuatum circinatum v. rarius subrectum, valvis per dehiscentiam sæpe tortis nec elasticis. Arbores fruticesve floribus capitatis v. laxe spicatis.—*America, Africa, Asia, Australia, inter tropicos.*

25. ENTEROLOBIUM. Legumen circinatum, carnosum, indehiscens. Cætera *Pithecolobii.*—*America tropica.*

26. SERIANTHES. Legumen compressum, sublignosum. Arbores floribus paucis in ordine magnis.—*Asia tropica, ins. maris Pacifici.*

27. ARCHIDENDRON. Ovarii carpella 3–5. Cætera *Pithecolobii.*—*Australia tropica.*

** *Folia simpliciter pinnata.*

28. INGA. Ovarii carpellum unicum.—*America tropica.*

29. AFFONSEA. Ovarii carpella 2–5.—*Brasilia.*

I. PENTACLETHRA, *Benth.*

Benth. et Hook. Gen. Pl. i. 588.

1. P. FILAMENTOSA, *Benth.! in Hook. Journ. Bot.* ii. 127. Pinnæ 10–20-jugæ;

foliola 30–50-juga, lineari-falcata, acutissima, 3–4 lin. longa. Staminodia 5.—*Fl. Bras. Mim.**

Acacia macroloba, Willd.! Spec. iv. 1060 (1054).
Mimosa macroloba, Poir. Dict. Suppl. i. 66.
Acacia aspidioides, G. F. W. Mey. Prim. Fl. Esseq. 165.
Entada Wrbeana, Presl, Epimel. Bot. 206, ex descr.
Caillea macrostachya, Steud.! in Flora, 1843, 759.
Pentaclethra brevipila, Benth.! in Hook. Journ. Bot. ii. 128.

Hab. Tropical America: North Brazil, Surinam, British Guiana, Trinidad, Nicaragua.

2. P. MACROPHYLLA, *Benth.! in Hook. Journ. Bot.* iv. 330. Pinnæ 10–12-jugæ; foliola 12–20-juga, oblique rhombeo-oblonga, obtusa, $\frac{3}{4}$–$1\frac{1}{2}$ poll. longa. Staminodia 10–15.—*Oliv.! Fl. Trop. Afr.* ii. 322.

Hab. Tropical Africa.

P. Griffoniana, Baill. Adans. vi. 206, from tropical Africa, described from leaves only, may not belong to the genus.

II. PARKIA, *R. Br.*

Benth. et Hook. Gen. Pl. i. 588.

Sectio 1. EUPARKIA.

Capitula clavata, parte inferiore sterili quam pars fertilis multo angustiore (v. in speciebus Americanis ei subæquilata?).

* *Species Asiaticæ.*

1. P. BIGLANDULOSA, *W. et Arn.! Prod. Fl. Penins. Ind. Or.* 279. Petiolus communis basi 2-glandulosus, sæpius velutino-tomentosus; pinnæ multijugæ; foliola confertim multijuga, ad 3 lin. longa, $\frac{1}{2}$ lin. lata.

Mimosa pedunculata, Roxb. Fl. Ind. ii. 551, ex descr.

Hab. East tropical Asia: the countries east of the Bay of Bengal, *Roxburgh.* Described by Arnott and others from cultivated specimens.

2. P. ROXBURGHII, *G. Don, Gen. Syst.* ii. 396. Petiolus communis supra basin uniglandulosus, glaber v. pubescens; pinnæ multijugæ, foliola laxe multijuga, 3–4 lin. longa, 1 lin. lata. Leguminis stipes 2–5-pollicaris.

Mimosa biglobosa, Roxb.! Fl. Ind. ii. 551, non Jacq.
Parkia Brunonis, Grah.! in Wall. Cat. Herb. Ind. n. 5288.
P. biglobosa, Benth. in Hook. Journ. Bot. iv. 328, quoad plantam Indicam.
Inga timoriana, DC.! Prod. ii. 442.
Mimosa peregrina, Blanco, Fl. Filip. 737, ed. 2, 509 ex descr.
Inga pyriformis, Jungh. ex Miq. Fl. Ind. Bat. i. pars i. 52.
Parkia grandis, Hassk. Diagn. Nov. 220, ex ejusd. Pl. Jav. Rar. 415.

Hab. Tropical Asia, Sillet, Burmah, and the Indian Archipelago.

P. intermedia and *P. speciosa,* Hassk. Hort. Bogor. 289, and Pl. Jav. Rar. 414, are distinguished by the author as well as by Miquel from *P. Roxburghii* by characters which, as far as shown by our speci-

* My Brazilian Mimoseæ for the great Flora Brasiliensis are now being printed in Germany; and I hoped to have received proofs time enough to refer to the page of each species. None, however, have yet reached me; but I have retained the general references with a view to indicating which are the species of which full descriptions may be there found.

mens, do not appear to be sufficient. The whole of the Asiatic species require, however, a thorough revision from much better specimens than we possess.

Acacia gigantea, Noronh. in Verh. Acad. Batav., is referred by Hasskarl to his *Parkia speciosa*.

3. P. LEIOPHYLLA, *S. Kurz, in Journ. Asiat. Soc.* xlii. 73. Foliola iis *P. Roxburghii* majora, iis *P. intermediæ*, Oliv., similia.

Hab. Tropical Asia: Pegu.

I have seen fragments only of this plant, insufficient to give any idea of its specific value.

4. P. MACROCARPA, *Miq. Fl. Ind. Bat. Suppl.* 284, a *P. Roxburghii* differre dicitur foliolis obtusis rectis.

Hab. Tropical Asia: Sumatra. I have seen no specimen.

5. P. INSIGNIS, *S. Kurz, in Journ. Asiat. Soc. Beng.* xlii. 74. Fulvo-pubescens. Pinnæ sub-4-jugæ: foliola 20–25-juga, pollicaria, subtus pubescentia. Legumen ignotum.

Hab. Tropical Asia: Martaban. I have seen no specimens.

6. P. SINGULARIS, *Miq. Fl. Ind. Bat.* i. *pars* i. 1078, *Suppl.* 285. Pinnæ 1–4-jugæ; foliola 3–5-juga, ovato-oblonga, 2-pollicaria. Legumina oblonga.

Hab. Tropical Asia: Sumatra. I have seen no specimen of this plant, which must have a very different aspect from all the other species.

P. sumatrana, Miq. Fl. Ind. Bat. Suppl. 284, from Sumatra, is described from leaves only, which do not appear to me to have quite the aspect of those of a *Parkia*.

** *Species Africanæ.*

7. P. AFRICANA, *R. Br. in App. Denh. & Clapp. Trav.* 234. Petiolus communis infra pinnarum jugum infimum eglandulosus; pinnæ multijugæ; foliola multijuga, 4–5 lin. longa, ad 1 lin. lata, rectiora quam in *P. Roxburghii*. Legumen longum, rectum, stipite vix pollicem excedente.

Mimosa biglobosa, Jacq. Stirp. Amer. 267, t. 179; Beauv. Fl. Ow. et Ben. ii. 53, t. 90.

Inga biglobosa, Willd. Spec. iv. 1025.

Parkia biglobosa, Benth.! in Hook. Journ. Bot. iv. 328, quoad plantam Africanam; Oliv. Fl. Trop. Afr. ii. 324.

Mimosa taxifolia, Pers. Syn. ii. 266.

Inga senegalensis, DC. Prod. ii. 442.

Inga fæculifera, Desv.! in Ham. Prod. Pl. Ind. Occid. 61.

Prosopis fæculifera, Dev.! in Ann. Sc. Nat. ser. 1, ix. 426.

Parkia uniglobosa, G. Don, Gen. Syst. ii. 397.

Hab. Tropical Africa. Apparently introduced into the West Indies with the Negroes, and first described by Jacquin from Martinica, and by Desvaux from St.-Domingo specimens. There are also in Herb. Hooker leaves from Demerara, *Parker*, which appear to belong to the same species.

8. P. INTERMEDIA, *Oliv.! Fl. Trop. Afr.* ii. 324. Petiolus communis basi uniglandulosus; pinnæ multijugæ; foliola multijuga, subfalcata, 6–8 lin. longa, 1½–2 lin. lata. Legumen falcatum, stipite pollicari.

Hab. Tropical Africa.

9. P. FILICOIDEA, *Welw. in Oliv.! Fl. Trop. Afr.* ii. 324. Petiolus communis basi

obscure uniglandulosus; pinnæ multijugæ; foliola multijuga, oblonga, subrecta, coriacea, $\frac{1}{2}$–1 poll. longa, 3 lin. lata. Leguminis stipes $1\frac{1}{2}$–2-pollicaris.

Hab. Tropical Africa.

*** *Species Americanæ.*

10. P. PLATYCEPHALA, *Benth.! in Hook. Journ. Bot.* iv. 329. Pinnæ 6–12-jugæ; foliola multijuga, linearia, subrecta, uninervia, ad 3 lin. longa. Capitula in pedunculo $\frac{1}{2}$–1-pedali depresso-globosa, receptaculo depresso-dilatato. Legumen oblongum (4 poll. longum 1–$1\frac{1}{4}$ poll. latum) carnosum, *seminibus 2-seriatis.*—*Fl. Bras. Mim.*

Hab. Tropical America; Brazil, prov. Bahia and Ceara.

11. P. PENDULA, *Benth. in Walp. Rep.* v. 577. Pinnæ multijugæ; foliola multijuga, linearia, obscure uninervia, vix 2 lin. longa. Capitula pedunculo 2–∞-pedali pendula, globosa, receptaculo globoso v. obovoideo. Legumen curvum, (3–8 poll. longum, vix 1 poll. latum,) siccum bivalve, marginibus incrassatis, seminibus obscure 2-seriatis.—*Fl. Bras. Mim.*

Inga pendula, Willd.! Spec. iv. 1025.

Mimosa pendula, Poir. Dict. Suppl. i. 47.

Hab. Tropical America: North Brazil.

12. P. MULTIJUGA, *Benth.! in Mart. Fl. Bras. Mim.* Pinnæ multijugæ; foliola multijuga, linearia, subfalcata, basi adpresse auriculata, uninervia (sub 4 lin. longa, 1–$1\frac{1}{4}$ lin. lata). Capitula pedunculo 1–2-pollicari globosa, bracteis ante anthesin cum alabastris imbricatis.

Hab. Tropical America: Brazil, Upper Amazon and Rio Janeiro.

The specimens I have seen are in bud only, or with the flowers already fallen away, and the fruit is unknown. The affinities of the species, remarkable for the imbricate bracts which give the young heads the aspect of Mauritius fruits, remain therefore uncertain; and it may also prove that the specimens from the two widely distant stations, however closely they resemble each other in that state, may belong to distinct species.

Sect. 2. PARYPHOSPHÆRA.

Capitula biglobosa, parte superiore sterili, ob staminodia elongata parte fertili duplo latiore. Species Americanæ.

13. P. PECTINATA, *Benth.! in Mart. Fl. Bras. Mim.* Pinnæ 10–15-jugæ; foliola multijuga, linearia, subsigmoideo-falcata, basi auriculata, uninervia. Pedunculi 4–8-pollicares. Legumina elongata, falcata.

Inga pectinata, Humb. et Bonpl.! in Willd. Spec. iv. 1026.

Acacia pectinata, H., B. et K.! Nov. Gen. et Sp. vi. 282.

Mimosa pectinata. Poir. Dict. Suppl. i. 48.

Hab. Tropical America: North Brazil.

14. P. FILICINA, *Benth. in Walp. Rep.* v. 577. Pinnæ 8–10-jugæ; foliola multijuga, linearia, subsigmoideo-falcata, basi oblique truncata, exauriculata. Pedunculus 8-pollicaris, complanatus. Legumen ignotum.—*Fl. Bras. Mim.*

Inga filicina, Willd.! Spec. iv. 1025.

Mimosa filicina, Poir. Dict. Suppl. i. 47.

Hab. Tropical America: Para in Brazil.

15. P. AURICULATA, *Spruce!*; *Benth. in Mart. Fl. Bras. Mim.* Pinnæ 6–8-jugæ; foliola multijuga, oblongo-linearia, subsigmoideo-falcata, basi auriculata, 2–3-nervia, semipollicaria. Pedunculi 3–4-pollicares. Staminodia $\frac{3}{4}$–1 poll. longa. Legumina oblonga, 4-pollicaria, stipite 2–3 poll. longo.

Hab. Tropical America: North Brazil.

16. P. DISCOLOR, *Spruce!*; *Benth. in Mart.Fl. Bras. Mim.* Pinnæ 3–4-jugæ; foliola multijuga, oblongo-linearia, subsigmoideo-falcata, basi auriculata, 2–3-nervia, 6–9 lin. longa, subtus canescentia. Pedunculi 3–4-pollicares. Staminodia vix semipollice longiora.

Hab. Tropical America: North Brazil.

17. P. NITIDA, *Miq. Stirp. Surin.* 7, *et in Flora*, 1850, 278. Pinnæ 7–10 jugæ; foliola multijuga, oblongo-linearia, subsigmoideo-falcata, basi late rhachi appressa nec auriculata. 1–2-nervia, 6–9 lin. longa, concoloria. Pedunculi 6–9-pollicares. Staminodia vix semipollice longiora.

Hab. Tropical America: Surinam.

18. P. PARYPHOSPHÆRA, *Benth.* Folia alterna. Pinnæ 5–6-jugæ; foliola multijuga, oblongo-linearia, subrecta, basi auriculata, 2–3-nervia, 6–9 lin. longa; subtus pallida. Pedunculi 1–2-pollicares. Staminodia subpollicaria. Legumen rectum, subpedale.

Paryphosphæra arborea, Karst.! Pl. Colomb. ii. 7. t. 104.

Hab. Tropical America: Columbia, eastern declivity of the Cordillera of Bogota, *Triana, Karsten.*

19. P. OPPOSITIFOLIA, *Spruce!*; *Benth. in Mart. Fl. Bras. Mim.*. Folia opposita. Pinnæ 3–5-jugæ; foliola multijuga, oblongo-linearia, basi auriculata, uninervia v. nervo altero marginali. Pedunculi oppositi, 3–6-pollicares. Staminodia longa, nivea. Legumina elongata, incurva.

Hab. Tropical America: North Brazil.

III. ENTADA, *Adans.*

Benth. et Hook. Gen. Pl. i. 589.

* *Legumen lignosum, latum, pluripedale. Species amphigea.*

1. E. SCANDENS, *Benth. in Hook. Journ. Bot.* iv. 332. Altissime scandens. Petiolus communis sæpius cirrifer; pinnæ 2-jugæ; foliola 2–5-juga, oblique elliptico-oblonga v. obovata, obtusa v. emarginata, $1\frac{1}{2}$–3-pollicaria. Spicæ longæ, axillares v. in panicula paucæ.—*Oliv.! Fl. Trop. Afr.* ii. 325; *Harv.! et Sond. Fl. Cap.* ii. 276; *Benth.! Fl. Austral.* ii. 298.

Mimosa scandens, Linn. Spec. 1501.
Acacia scandens, Willd. Spec. iv. 1057.
Adenanthera scandens, Forst. Prod. 33.
Entada gigalobium, *E. Pursætha*, *E. monostachya* et *E. adenanthera*, DC. Prod. ii. 424, 425.
E. Rheedii et *E. Parrana*, Spreng. Syst. ii. 325.
E. Gandu, Hoffm. ex Walp. Rep. i. 858.
E. Pursætha et *E. Rumphii*, Scheff. in Natuurk. Tijdschr. Ned. Ind. xxxii. 90, t. 16 ad 18.

Hab. Tropical Asia, Africa, and Australia, extending to subtropical South Africa; also tropical America, West Indies, and Central America.

** *Legumen intra margines coriaceum v. membranaceum.*

† *Species Africanæ. Spicæ axillares v. in panicula paucæ.*

2. E. WAHLBERGII, *Harv. Fl. Cap.* ii. 277. Scandens, glabra. Petiolus communis interdum cirrifer; pinnæ 2-jugæ; foliola 4–18-juga, linearia, subsemipollicaria. Spicæ cylindraceæ, floribus pedicellatis. Legumen curvum, membranaceum, 1–1½ poll. latum. —*Oliv. ! Fl. Trop. Afr.* ii. 326.

Hab. Tropical and subtropical Africa: Upper Guinea, Mozambique and Natal districts.

3. E. AFRICANA, *Guill. et Perr. Fl. Seneg.* 233. Arborea, glabra. Pinnæ 3–4-jugæ; foliola 8–15-juga, oblonga, obtusa, ½–3¼ poll. longa. Legumen subcoriaceum, 4 poll. latum.—*Oliv. ! Fl. Trop. Afr.* ii. 326.

Hab. Tropical Africa: Upper Guinea.

4. E. KIRKII, *Oliv. ! Fl. Trop. Afr.* ii. 327. Scandens, glabra. Pinnæ 3–4-jugæ; foliola 8–15-juga, oblonga, obtusa, ½–¾ poll. longa. Legumen 2½–3½ poll. latum, subcoriaceum, articulis medio valde incrassatis.

Hab. Tropical Africa: Mozambique district.

5. E. NATALENSIS, *Benth. ! in Hook. Journ. Bot.* iv. 333. Fruticosa, pubescens, sæpe aculeata. Pinnæ 4–6-jugæ; foliola 8–15-juga, oblonga, obtusa, subsemipollicaria. Legumen membranaceum, 1–2 poll. latum.—*Harv. ! et Sond. Fl. Cap.* ii. 276.

Mimosa spicata, E. Mey. ! Comm. Pl. Afr. Austr. 164.

Adenopodia spicata, Presl, Epimel. Bot. 207.

Hab. South Africa: Natal district.

6. E. SUDANICA, *Schweinf. ! Rel. Kotsch.* 8, t. 8, 9. Arborescens, glabra. Pinnæ 5–8-jugæ; foliola 14–20-juga, oblonga, obtusa, ½–¾ poll. longa. Legumen 1½–2 poll. latum, inter semina insigniter constrictum.—*Oliv. ! Fl. Trop. Afr.* ii. 327.

Hab. Tropical Africa: Upper Guinea, Nile land, Mozambique district.

7. E. ABYSSINICA, *Steud. in A. Rich. Fl. Abyss.* i. 234. Arborea, glabra. Pinnæ 14–18-jugæ; foliola 25–50-juga, linearia, 3–5 lin. longa. Legumen 1½–2 poll. latum.—*Oliv. ! Fl. Trop. Afr.* ii. 327.

Hab. Tropical Africa; Nile land.

8. E.? DUPARQUETIANA, *Baill. Adans.* vi. 210. Arborea. Pinnæ 2-jugæ; foliola 1-juga, ovata, acuta, coriacea, glabra, 2–3-pollicaria. Spicæ axillares, geminæ, summæ racemosæ. Legumen ignotum.

Hab. Tropical Africa: Gaboon, *Duparquet* (*Baillon*). I have seen no specimen.

†† *Species Americanæ.*

9. E. POLYSTACHYA, *DC. Mem. Leg.* 434, t. 61, 62, *Prod.* ii. 425. Altissime scandens. Petiolus interdum cirrifer; pinnæ 2–6-jugæ; foliola 6–8-juga, oblonga, obtusa v. emarginata, ¾–1½-pollicaria. Spicæ breves, numerosissimæ, in racemo longo dense confertæ. Legumen 2–4 poll. latum.—*Fl. Bras. Mem.*

Mimosa Entada, Linn. ! Herb. (in Spec. 1502 cum *E. scandente* confusa).

Mimosa polystachia, Jacq. Stirp. Amer. 265, t. 183, Linn. Syst. Veg. 677.

Mimosa chiliantha, G. F. W. Mey. Prim. Fl. Esseq. 163.
Entada chiliantha, DC. Prod. ii. 425.
Mimosa bipinnata, Aubl. Pl. Gui. 946 (Plum. ed. Burm. t. 12).
Mimosa caudata, Vahl, Ecl. iii. 35.
Acacia caudata, DC. Prod. ii. 456.
Adenanthera Bonplandiana, Kunth ! Nov. Gen. et Sp. vi. 311.
Acacia secundiflora, Juss. Herb. ex DC.
Entada Plumieri, Spreng. Syst. Cur. Post. 164.

Hab. Tropical America: North Brazil, Surinam, Cayenne, British Guiana, Columbia; Central America, *Sutton Hayes*, *Tate*, *Œrsted*; Mexico, *Andrieux*, n. 409; Dominica, *Imray*; Trinidad, *Crueger*.

10. E. POLYPHYLLA, *Benth. ! in Hook. Journ. Bot.* ii. 133. Arborea v. alte scandens; Pinnæ 4–6-jugæ; foliola 15–20-juga, oblonga, obtusa, 4–8 lin. longa. Spicæ numerosissimæ, in racemo dense confertæ. Legumen $2\frac{1}{2}$ poll. latum.—*Fl. Bras. Mim.*.

Hab. Tropical America: North Brazil; Eastern Peru, Maynas, *Pœppig*; Cayenne, British Guiana.

11. E. ACACIÆFOLIA, *Benth. ! in Mart. Fl. Bras. Mim.* Pinnæ 10–12-jugæ; foliola multijuga, linearia, subfalcata, 3 lin. longa, costa submarginali. Spicæ fructiferæ axillares. Legumen 1 poll. latum.

Hab. Tropical America: Brazil.

IV. ELEPHANTORRHIZA, Benth.

Benth. et Hook. Gen. Pl. i. 590.

1. E. BURCHELLII, *Benth. in Hook. Journ. Bot.* iv. 344. Foliola ad 4 lin. longa, pleraque mucronato-acuta.—*Harv. et Sond. Fl. Cap.* ii. 277.

Acacia elephantina, Burch. ! Trav. ii. 236.
Acacia elephantorhiza, Burch. in DC. Prod. ii. 457.
Prosopis elephantina, E. Mey. ! Comm. Pl. Afr. Austr. 165.
Prosopis elephantorhiza, Spreng. Syst. Cur. Post. 165.

Hab. South-east Africa.

2. E. BURKEI, *Benth. in Hook. Lond. Jonrn.* v. 81. Foliola subsemipollicaria, obtusa, vix mucronata. Spicæ 3–4-pollicares.—*Harv. et Sond. Fl. Cap.* ii. 278.

Hab. South-east Africa, Macalisberg, *Burke and Zeyher*, rather further north than the *E. Burchellii*, of which, however, it is probably a variety only.

E. Petersiana, Bolle in Peters, Mossamb. Bot. 9, described from very imperfect specimens (which I have not seen), without leaves or fruit, is more likely to be an *Entada* than an *Elephantorhiza*, and perhaps not distinct from *E. scandens*.

V. PLATHYMENIA, Benth.

Benth. et Hook. Gen. Pl. i. 589.

1. P. RETICULATA, *Benth. in Hook. Journ. Bot.* iv. 334. Pinnæ 4–8-jugæ; foliola 10–15-juga, ovata v. elliptica, retusa, reticulato-venosissima, 5–9 lin. longa. Spicæ pubescentes.—*Fl. Bras. Mim.*

Chrysoxylon Vinhatico, Casar. Nov. Stirp. Dec. 59.

Hab. Tropical America: Brazil, prov. San Paolo, Minas Geraes, and Goyaz.

2. P. FOLIOLOSA, *Benth. in Hook. Journ. Bot.* iv. 334. Pinnæ 4–12-jugæ; foliola 12–20-juga, oblongo-elliptica, obtusa v. retusa, tenuiter venulosa. Spicæ glabræ.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia, Piauhy, Ceara, Goyaz, and Minas Geraes.

VI. PIPTADENIA, Benth.

Benth. et Hook. Gen. Pl. i. 589.

The independent character of this genus has been somewhat invalidated by the discovery of the *Piptadenia oudhensis* in the area of *Adenanthera*. It is, however, in its flat reticulated pod, exalbuminous seeds, and sessile flowers, a true *Piptadenia* rather than an *Adenanthera*. Its comparatively short dense spikes and foliage bring it nearer to the South American *P. fœtida*, than to any Old-World species of this or the allied genera.

Sectio 1. EUPIPTADENIA.

Spicæ cylindraceæ. Legumen planum, læve v. reticulatum, marginibus continuis nerviformibus v. incrassatis. Foliola nunc latiuscule pennivenia, nunc linearia v. oblonga.

* *Foliola obovata, ovata v. ovato-lanceolata, pennivenia, paucijuga.*

1. P. OUDHENSIS, *Brandis! For. Fl. Ind.* 168. Aculeata, glaucescens. Pinnæ 2-jugæ; foliola 1-juga, falcato-obovata v. subreniformia, obtusissima, coriacea, 2–3-pollicaria. Spicæ axillares, densæ, $1\frac{1}{2}$-pollicares. Legumen stipitatum, curvatum, $\frac{3}{4}$–1-pedale, 5–6 lin. latum.

Hab. Tropical Asia: Forests of Oudh.

2. P. FŒTIDA, *Benth.* Inermis, canescenti-tomentella. Pinnæ 1-jugæ; foliola 1-juga, obovato-oblonga, obtusa, $\frac{1}{2}$–1-pollicaria. Spicæ axillares v. laterales, densæ, 1–$1\frac{1}{2}$-pollicares. Ovarium stipitatum, villosum.

Mimosa fœtida, Jacq.! Hort. Schœnbr. iii.73, t. 390.

Inga fœtida, Willd. Spec. iv. 1008.

Acacia fœtida, H., B. et K.! Nov. Gen. et Sp. vi. 265.

Hab. Tropical America: Columbia, Mescala, *Humboldt and Bonpland.* Jacquin raised it from seeds supposed to be West-Indian, but perhaps really from Caraccas.

3. P. UAUPENSIS, *Spruce!*; *Benth. in Mart. Fl. Bras. Mim.* Scandens, minute puberula, parce aculeata. Petiolorum glandula globosa; pinnæ 2-jugæ; foliola 2–3-juga, obovata, $1\frac{1}{2}$–$2\frac{1}{2}$-pollicaria. Spicæ paniculatæ, tenues. Corollæ puberulæ.

Hab. Tropical America: North Brazil.

4. P. PATENS, *Benth. Bot. Sulph.* 89, *et in Hook. Lond. Journ.* v. 79. Scandens, pubescens, aculeata. Petiolorum glandula scutellata; pinnæ 3–4-jugæ; foliola sub-3-juga, obovata, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria. Spicæ paniculatæ, tenues. Corollæ glabræ.

Inga patens, Hook. et Arn.! Bot. Beech. 419.

Hab. Central America: Realejo and Tiger Island, *Sinclair*; Nicaragua, *Œrsted.*

There are two forms of this species, one with the leaflets all under 1 in., the other with most of them rather above that size.

Acacia prosopoides, DC. Prod. ii. 460, from the short diagnosis taken from a drawing of Moçino and Sessé's, would appear to be either *Piptadenia patens*, or *Mimosa laxiflora*, two very different plants, but both answering to the diagnosis.

5. P. LATIFOLIA, *Benth.! in Hook. Journ. Bot.* iv. 335. Scandens, glabra, aculeata. Pinnæ 3–4-jugæ; foliola 2–3-juga, obovata v. orbiculata, majora $\frac{3}{4}$–1-pollicaria. Spicæ tenues, paniculatæ. Corollæ glabræ. Ovarium stipitatum, villosum.—*Fl. Bras. Mim.*

Acacia fruticosa, Mart.! Herb. Fl. Bras. 107.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

6. P. LAXA, *Benth.! in Hook. Journ. Bot.* iv. 335. Scandens?, glabra v. puberula, aculeis parvis nunc rarissimis. Pinnæ 2–4-jugæ; foliola 4–7-juga, oblique ovata v. obovato-elliptica, majora $\frac{1}{2}$–$\frac{3}{4}$-pollicaria. Spicæ tenues, axillares v. paniculatæ. Corollæ glabræ. Ovarium stipitatum, villosum.—*Fl. Bras. Mim.*

Mimosa fruticosa, Vell. Fl. Flum. Ic. xi. t. 6.

Acacia fruticosa, var. *acutifolia,* Mart.! Herb. Fl. Bras. 108.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Bahia, San Paolo and Minas Geraes, and apparently the same at Yurimaguas in eastern Peru, *Pœppig.*

Acacia adiantoides, Spreng. Syst. iii. 146, would appear from his short diagnosis to be a pubescent form of *P. laxa.*

7. P. PŒPPIGII, *Klotzsch! in Herb. Mus. Berol.* Arborea, inermis. Pinnæ 2–3-jugæ; foliola 3–4-juga, ovata, obtuse acuminata, $1\frac{1}{2}$–3-pollicaria. Spicæ paniculatæ. Ovarium villosum.—*Fl. Bras. Mim.*

Stryphnodendron paniculatum, Pœpp. et Endl.! Nov. Gen. et Sp. iii. 81, t. 291.

Hab. Tropical America: North Brazil.

8. P. POLYSTACHYA, *Miq. in Linnæa,* xviii. 590. Arborea, inermis. Pinnæ 3–4-jugæ; foliola 4–7-juga, ovato- v. elliptico-lanceolata, obtuse acuminata, sub-2-pollicaria. Spicæ paniculatæ. Ovarium stipitatum, villosum.

Hab. Tropical America: Bergendaal in Surinam.

I have not seen this species; but from Miquel's description it must be very near to, if not identical with, *P. Pœppigii.* Should it prove to be the same, Miquel's name will have to be preferred to Klotzsch's.

9. P. PANICULATA, *Benth.! in Hook. Journ. Bot.* iv. 338. Arborea, inermis. Pinnæ 2–4-jugæ; foliola 4–8-juga, ovali-oblonga v. ovato-lanceolata, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria. Spicæ tenues, paniculatæ. Corollæ puberulæ. Ovarium sessile, glabrum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

** *Foliola oblonga, obtusa,* 1-*nervia, plurijuga. Semina* (*ubi nota*) *alata.*

10. P. RAMOSISSIMA, *Benth.! in Hook. Journ. Bot.* iv. 336. Fruticosa, aculeis recurvis minimis. Pinnæ 3–5-jugæ; foliola 10–15-juga, oblonga, obtusa, 3–4-linearia, costa excentrica. Spicæ paniculatæ. Flores minimi, glabri. Ovarium stipitatum, villosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia.

11. P. PTEROSPERMA, *Benth! in Hook. Journ. Bot.* iv. 338. Inermis. Pinnæ 4–5-jugæ; foliola 8–15-juga, oblonga, obtusa, costa subcentrali. Spicæ fructiferæ axillares. Semina late alata.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, *Sello.*

12. P.? MANNII, *Oliv.! Fl. Trop. Afr.* ii. 329. Fruticosa, glabra, inermis. Pinnæ 4–6-jugæ; foliola 8–13-juga, oblonga, obtusa, subsemipollicaria. Spicæ tenues, 4-pollicares, paniculatæ. Ovarium glabrum.

Hab. Tropical Africa: Fernando Po, *Mann.*

The fruit of this plant is unknown, and it is in some measure doubtful whether it be a *Piptadenia* or an *Entada*. There is no gland on the petiole, and only very minute ones between the leaflets of a few of the upper pairs.

13. P. CHRYSOSTACHYS, *Benth.* Inermis, puberula. Pinnæ 3–6-jugæ; foliola 8–15-juga, oblonga, obtusa, subsemipollicaria. Spicæ densæ, 3-pollicares. Ovarium glabrum. Semina alata.

Mimosa chrysostachys, Hels. et Boj.! in herb. plur.
Acacia chrysostachys, Sweet, Hort. Brit. 167.
Adenanthera chrysostachys, Benth. in Hook. Journ. Bot. iv. 343.
Stachychrysum pterospermum, Boj. Hort. Maurit. 114.

Hab. Madagascar: prov. Emirna and Imamou, *Bojer.*

Ramuli obscure angulati, uti petioli et pedunculi pube brevi laxa conspersi, in partibus junioribus copiosa, demum fere evanida. Foliorum petiolus communis 4–5-pollicaris. Pinnæ oppositæ v. hinc inde alternæ, sub-3-pollicares, superiores et inferiores breviores. Glandulæ in petiolo nullæ. Foliola opposita, 4–6 lin. longa, ad 1½ lin. lata, basi intus angustata, extus fere auriculata, obtusissima, uninervia et obscure pennivenia, supra glaberrima, subtus pilosula. Spicæ in axillis superioribus solitariæ v. geminæ, brevissime pedunculatæ. Flores pedicello ½–1 lin. longo fulti. Calyx canescens, ½ lin. longus, breviter et obtuse 5-lobus. Corollæ petala oblonga, obtusa, 1 lin. longa, extus canescentia. Stamina breviter exserta. Legumen non vidi, sed ex nomine specifico Bojeriano semina alata dicenda.

*** *Foliola linearia, multijuga.*

† *Ovarium villosum.*

14. P. NITIDA, *Benth. in Hook. Journ. Bot.* iv. 336. Arborea, inermis. Pinnæ 6–10-jugæ; foliola vix falcata, nitida, costa parum excentrica, 2–3 lin. longa. Ovarium longe stipitatum. Legumen rectum.

Acacia filicicoma, Mart.! Herb. Fl. Bras. 109, excl. var. β.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

15. P. SUAVEOLENS, *Miq. in Linnæa*, xviii. 589. Arborea, inermis. Pinnæ 6–10-jugæ; foliola subfalcata, nitida, costa excentrica, 2–3 lin. longa. Legumen ignotum.

Hab. Tropical America: Surinam, near Bergendaal.

The character given by Miquel appears to me to agree much better with the Brazilian *P. nitida* than with the Trinidad plant with which Grisebach has identified it, and which I cannot distinguish from the Columbian *P. flava*. The Surinam plant may, however, prove to be different from either.

16. P. CONTORTA, *Benth.! in Mart. Fl. Bras. Mim.* Arborea, inermis. Pinnæ 10–15-jugæ; foliola falcata, nitida, costa marginali, 1–2 lin. longa. Glandula petiolaris scutellata. Ovarium longe stipitatum. Legumen elongatum, sæpius contortum.

Acacia contorta, DC.! Prod. ii. 470.
Acacia filicicoma, β, tenuior, Mart.! Herb. Fl. Bras. 110.
Piptadenia filicicoma, Benth.! in Hook. Journ. Bot. iv. 336.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

17. P. FOLIOLOSA, *Benth.! in Hook. Journ. Bot.* iv. 336. Arborea, inermis. Pinnæ 12–20-jugæ: foliola falcata, nitida, costa submarginali, 2–2½ lin. longa. Ovarium breviter stipitatum. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: North Brazil, on the Amazon, *Pœppig.*

18. P. MACRADENIA, *Benth.! in Hook. Journ. Bot.* iv. 335. Arborea?, inermis v. aculeis raris minimis. Pinnæ 6–10-jugæ; foliola falcata, nitida, costa subcentrali, 3–4 lin. longa. Glandula petiolaris maxima, oblonga. Ovarium longiuscule stipitatum. Legumen rectum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

Resembles *P. communis*, and, like that species and *P. pteroclada*, has the second year's branches often bordered by corky wings, but readily distinguished from them by the large gland and by the villous ovary.

19. P. MICRACANTHA, *Benth.! in Mart. Fl. Bras. Mim.* Scandens, aculeis minutis paucis. Pinnæ 8–15-jugæ; foliola falcata, nitida, costa submarginali, 1–2 lin. longa. Petiolus sæpius eglandulosus. Ovarium breviter stipitatum.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

Resembles *P. contorta*, with similar small leaflets; but the scandent habit, the presence of small prickles, and several minor characters appear sufficiently to distinguish it.

Mimosa dumetorum, A. de St.-Hil. Pl. Rem. Brés. Introd. 11 (*Acacia dumetorum*, DC. Prod. ii. 458), from the very short diagnosis given, is probably a *Piptadenia* closely allied to, if not identical with, *P. micracantha*.

†† *Ovarium glabrum.*

‡ *Corolla tenuis, calyce minimo 4–5plo longior. Stamina longa.*

20. P. BIUNCIFERA, *Benth. in Hook. Journ. Bot.* iv. 337. Arborea, aculeis stipularibus geminis recurvis. Pinnæ 8–12-jugæ; foliola falcata, obtusa, 2–3-linearia. Spicæ laxæ, 3-pollicares. Legumen 8–9 poll. longum, 1 poll. latum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Piauhy and Bahia.

Very closely allied to *P. subtilifolia*, from which, as far as hitherto known, it differs in the longer looser spikes and in the pods very much longer in proportion to the breadth. Both species are remarkable for the small calyx, long narrow corolla divided to the middle only, and the long stamens, all rather of a *Mimosa* than of a *Piptadenia*; but both the pod and the glands of the anthers are those of *Piptadenia*.

21. P. SUBTILIFOLIA, *Benth. in Hook. Journ. Bot.* iv. 337. Arborea, aculeis geminis stipularibus subrectis v. recurvis v. inermis. Pinnæ 5–10-jugæ; foliola falcata, obtusa, $1\frac{1}{2}$–2-linearia. Spicæ longiusculæ, 1–2-pollicares. Legumen "oblongum."

Acacia subtilifolia, H., B. et K.! Nov. Gen. et Sp. vi. 268 (aculeata).

Acacia viridiflora, Kunth! Mim. 81, t. 25 (subinermis), non Benth. Pl. Hartw.

Hab. Tropical America: Ecuador, banks of the Chota river, and at San Felipe in the district of Bracamoras, *Humboldt and Bonpland.*

‡‡ *Petala (more specierum plurimarum) calyce subduplo longiora, staminibus breviter exsertis.*

22. P. RIGIDA, *Benth. in Hook. Journ. Bot.* iv. 338. Inermis, subglabra. Pinnæ 3–6-jugæ; foliola falcata, nitida, convexiuscula, 2–5-nervia, costa submarginali, 4-linearia. Spicæ 1–$1\frac{1}{2}$-pollicares. Semina anguste alata.—*Fl. Bras. Mim.*

Acacia Angico, Mart.! Syst. Mat. Med. Veg. Bras. 53.

Hab. Subtropical and extratropical South America: Brazil, prov. Rio Grande do Sul and Paraguay.

23. P. BOLIVIANA, *Benth.* Inermis, tomentella. Pinnæ 3–6-jugæ; foliola falcata, convexiuscula, 1-nervia, costa submarginali, 2-linearia. Spicæ 1–1½-pollicares.

Hab. Bolivia, *Kelly* (a specimen originally in Herb. Lambert, now at Kew).

P. rigidæ certe valde affinis, diversa tamen videtur pube v. tomento minuto in ramulis petiolis inflorescentia foliolisque novellis rufescente, et foliolis dimidio minoribus costa sola subtus conspicua. Legumen adhuc ignotum.

24. P. AFRICANA, *Hook. f.! Fl. Nigr.* 330. Inermis, tomentella. Pinnæ 10–13-jugæ; foliola falcata, nitida, plano-concava, enervia, subtus obscure striolata, sub-3-linearia. Spicæ 3–4-pollicares.—*Oliv.! Fl. Trop. Afr.* ii. 328.

Hab. Tropical Africa: Upper and Lower Guinea, also apparently the same species on the Zambesi, *Kirk.*

Evidently much more nearly allied to the two preceding species than to either of the other Old-World *Piptadeniæ.*

25. P. TRISPERMA, *Benth.! in Hook. Journ. Bot.* iv. 337. Scandens, aculeis sparsis v. raris recurvis infrastipularibus. Pinnæ 3–6-jugæ; foliola obliqua, nitida, 3–6 lin. longa, margine nerviformi cincta, costa parum excentrica.—*Fl. Bras. Mim.*

Mimosa trisperma, Vell. Fl. Flum. Ic. xi. t. 40.

Acacia trisperma, Mart.! Herb. Fl. Bras. 108.

Hab. Tropical America: Brazil, prov. Rio Janeiro and Bahia.

26. P. POLYPTERA, *Benth.! in Mart. Fl. Bras. Mim.* Scandens, aculeis recurvis infrastipularibus minimis. Pinnæ 10–15-jugæ; foliola subdimidiata, nitida, 2–3 lin. longa, margine nerviformi cincta, costa valde excentrica.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

27. P. COMMUNIS, *Benth.! in Hook. Journ. Bot.* iv. 337. Arborea v. fruticosa, aculeis ad angulos v. alas ramorum parvis rectis v. incurvis. Pinnæ 5–12-jugæ; foliola falcata, nitidula, 2–4 lin. longa, immarginata, costa parum excentrica. Spicæ axillares v. breviter racemosæ.—*Fl. Bras. Mim.*

Acacia gonoacantha, Mart.! Herb. Fl. Bras. 109.

Acacia callosa, Spreng. Syst. iii. 138?

Hab. Tropical America: Brazil, prov. Rio Janeiro, San Paolo, Bahia, Piauhy, Pernambuco.

28. P. PTEROCLADA, *Benth.* Arborea, aculeis ad angulos v. alas ramorum paucis parvis rectis. Pinnæ 12–18-jugæ; foliola falcata, nitida, 3–4 lin. longa, immarginata, costa parum excentrica. Spicæ longe racemosæ.

Hab. Tropical America: Eastern Peru, woods and campos near Tarapoto, *Spruce,* n. 4536.

Arbor procera, fide Sprucei 80-pedalis, trunco inermi, undique glaberrima v. rhachi spicarum vix puberula. Ramuli novelli subteretes, annotini sæpius angulis 4–5 valde elevatis suberoso-alati. Aculei ad angulos pauci, breves, basi lati, in speciminibus recti. Foliorum petiolus communis 8–10 poll. longus, pinnæ 2–3-pollicares. Glandula ad basin petioli oblonga, parva, elevata, nunc obscura, ad juga superiora 2–3 pinnarum parvæ, ad foliolorum paria 2–3 superiora minimæ. Foliola ultra 50-juga, lineari-falcata, marginibus ut in *P. rigida* recurvis, costa tamen minus excentrica. Spicæ tenues, ad 3 poll. longæ, secus rhachin racemi v. paniculæ terminalis aphylli subpedalis per 2–3 fasciculatæ. Calyx ½ lin. longus. Corolla lineam longa. Legumen ignotum.

29. P. FLAVA, *Benth.* Arborea v. fruticosa, pubescens v. glabrata, aculeis demum recurvis sparsis, v. inermis. Pinnæ 6–10-jugæ; foliola membranacea, 2–4 lin. longa, rectiuscula, plana, costa parum excentrica, pallida. Spicæ axillares v. breviter racemosæ.

Acacia flava, Spreng.! Syst. iii. 141; DC.! Prod. ii. 469.

Piptadenia viridiflora, Benth. in Hook. Journ. Bot. iv. 337, excl. syn.

Piptadenia suaveolens, Griseb. Fl. Brit. W. Ind. 710, non Miq.

Hab. Tropical America: Ecuador, Guayaquil, *Hartweg*, n. 653; Columbia, Trujillo, *Moritz*, n. 1461; Trinidad, *Crueger*; Santa Marta, *Bertero*.

I believe I am correct in uniting all the specimens above quoted as one species, which I formerly mistook for the *Acacia viridiflora* of Kunth, but which now, since I have seen Kunth's plant, I find to be very different. The *P. flava* has the calyx half as long as the corolla, and in the dried state is thickened at the base into a small ring; and the petals, as in most *Piptadeniæ*, are free nearly to the base without the narrow tube of *P. subtilifolia*, to which I have above referred the *Acacia viridiflora*. The *Acacia flava* of DC. was founded on specimens of Bertero, in fruit only. The foliage agrees with that of our plant, and the inflorescence had been evidently similarly spicate; but the pods are smaller than those of Hartweg's Guayaquil specimens; the identity of the two plants may therefore still be in some measure doubtful.

Sectio 2. PITYROCARPA.

Spicæ cylindraceæ. Legumen inter semina sæpius constrictum, marginibus haud incrassatis, valvis coriaceis, siccitate glanduloso-leprosis. Arbores inermes. Foliola latiuscula, uninervia.

30. P. BLANCHETI, *Benth.! in Mart. Fl. Bras. Mim.* Glabra. Pinnæ 1- rarius 2-jugæ; foliola 2–3-juga, petiolulata, oblique ovali- v. obovali-oblonga, obtusa, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria. Spicæ axillares, 1–$1\frac{1}{2}$-pollicares. Ovarium glabrum.

Hab. Tropical America: Brazil, prov. Bahia.

31. P. INÆQUALIS, *Benth.! in Hook. Journ. Bot.* iv. 339. Subglabra. Pinnæ 2–3-jugæ; foliola 2–5-juga, sessilia, falcato-ovata v. oblonga, 1–3-pollicaria v. hinc inde minora. Spicæ axillares, sub-2-pollicares. Ovarium glanduloso-puberulum.—*Fl. Bras. Mim.*

Entada ingæfolia, Presl, Epimel. Bot. 205, ex char.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

32. P. LEPTOSTACHYA, *Benth.! in Hook. Journ. Bot.* iv. 339. Puberula v. glabrata. Pinnæ 3–4-jugæ; foliola 5–8-juga, oblique falcato-ovata v. oblonga, nitida, vix pollicaria. Spicæ axillares, graciles, folio vix breviores. Ovarium glabrum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

33. P. MONILIFORMIS, *Benth.! in Hook. Journ. Bot.* iv. 339. Tomentoso-pubescens. Pinnæ 2–4-jugæ; foliola 7–10-juga, oblique ovata subrhombea, 4–6 lin. longa, supra nitida nigricantia, subtus tomentosa. Spicæ axillares, 2–3-pollicares. Legumen inter semina valde constrictum.—*Fl. Bras. Mim.*

Sophora obliqua, Pers. Syn. Pl. i. 452.

Acacia Thibaudiana, DC.! Prod. ii. 456.

Hab. Tropical America: Brazil, prov. Bahia and Piauhy.

34. P. PSILOSTACHYA, *Benth. ! in Hook. Journ. Bot.* iv. 336. Puberula. Pinnæ 7–10-jugæ; foliola multijuga, oblonga, subfalcata, obtusa, 4 lin. longa, glabra, nitida, sub-2-nervia. Spicæ graciles, axillares, 2–3-pollicares. Ovarium stipitatum, villosum.

Acacia psilostachya, DC. ! Prod. ii. 457.

Acacia stenostachya, Desv. ! in Ham. Prod. Pl. Ind. Occid. 59.

Inga stenostachya, Desv. in Ann. Sc. Nat. ser. 1. ix. 427.

Hab. Tropical America: Cayenne, *Martin*; Surinam, *Wullschnagel.*

Rami leviter striati. Stipulæ parvæ, ovatæ, sæpe desunt. Foliorum petiolus communis sub-4-pollicaris. Pinnæ 3-pollicares. Glandula majuscula oblonga ad basin petioli, minor infra jugum supremum pinnarum, minima infra foliorum paria 1–3 superiora. Spicæ in axillis summis v. ad apices ramorum fasciculatæ. Flores $\frac{3}{4}$ lin. longi, extus cano-tomentelli. Legumen ignotum, et idcirco locus in systemate adhuc incertus.

Sectio 3. NIOPA.

Capitula globosa. Legumen inter semina constrictum v. subcontinuum, planum, coriaceum, marginibus nerviformibus incrassatis. Arbores inermes. Pinnæ multijugæ. Foliola multijuga, parva, linearia.

The four species comprised in this section differ remarkably from the rest of the genus in their globose capitate inflorescence; and two of them, without the characteristic gland of the anthers, would appear in these respects to have been better placed in *Leucæna*; but they are too closely connected with the two species which have the gland to be separated from them; and the pod and especially the broad orbicular very flat and thin exalbuminous seeds are entirely those of *Piptadenia,* and not of *Leucæna.*

* *Antheris glanduliferis.*

35. P. MACROCARPA, *Benth. ! in Hook. Journ. Bot.* iv. 341. Pinnæ multijugæ; foliola multijuga, parva. Pedunculi ad axillas fasciculati, summi vix racemosi. Legumen subfalcatum, $\frac{3}{4}$–1 poll. latum, inter semina nonnisi seminum abortione contractum, opacum v. nitidulum.—*Fl. Bras. Mim.*

P. microphylla, Benth. ! *l. c.* (non *Acacia microphylla,* Willd.).

Acacia grata, Willd. Enum. Hort. Berol. 1056, ex diagnosi nimis brevi.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Minas Geraes, Goyaz and Mattogrosso; Bolivia, *Weddell, D'Orbigny*; Tucuman, *Tweedie*; and perhaps also Loxa in Ecuador, *Jameson*; but the determination of flowering specimens without the fruits is often very doubtful.

36. P. COLUBRINA, *Benth. in Hook. Journ. Bot.* iv. 341. Pinnæ multijugæ; foliola multijuga, parva. Pedunculi fasciculati, ad apices ramorum racemosi v. paniculati, inferioribus paucis axillaribus. Legumen elongatum, $\frac{1}{2}$–$\frac{3}{4}$ poll. latum, inter semina regulariter constrictum, nitidum, læve v. reticulatum.—*Fl. Bras. Mim.*

Mimosa colubrina, Vell. Fl. Flum. Ic. xi. t. 16.

Acacia colubrina, Mart. ! Herb. Fl. Bras. 107.

Acacia peregrina, Kunth ! Mim. 96. t. 30, excl. syn. Linn.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Bahia, San Paolo, Goyaz; Bolivia, Sorata, *Mandon,* n. 760; Tucuman, *Tweedie*; Peru, Chota, *Humboldt and Bonpland*; Huanuco, *Matthews,* n. 907.

** *Antheris eglandulosis.*

37. P. PEREGRINA, *Benth.! in Hook. Journ. Bot.* iv. 340 *pro parte.* Glabra v. vix tomentella. Pinnæ 10–13-jugæ; foliola multijuga, linearia, imbricata, 1½–2 lin. longa, costa tenui v. vix conspicua. Legumen semipedale, 6–8 lin. latum, coriaceum, subleprosum, marginibus vix incrassatis.—*Fl. Bras. Mim.*

Mimosa peregrina, Linn. Spec. 1504.
Acacia peregrina, Willd.! Spec. iv. 1073, non Kunth.
Acacia microphylla, Willd. *l. c.*
Mimosa parvifolia, Poir. Dict. Suppl. i. 74.
Acacia Niopo, H., B. et K. Nov. Gen. et Sp. vi. 282.
Inga Niopo, Willd. Spec. iv. 1027.
Mimosa Niopo, Poir. Dict. Suppl. i. 48.
Acacia angustiloba, DC. Prod. ii. 470.
Mimosa? acacioides, Benth.! in Hook. Journ. Bot. ii. 132.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Minas Geraes, Goyaz, and Rio Negro; Guiana, Trinidad, Venezuela.

38. P. FALCATA, *Benth.! in Hook. Journ. Bot.* iv. 341. Glabra. Pinnæ 10–18-jugæ; foliola multijuga, linearia, 2½–3 lin. longa, coriacea, nitida. Legumen semipedale v. longius, ad ¾ poll. latum, coriaceum, marginibus vix incrassatis.—*Fl. Bras. Mim.*

Hab. Tropical and subtropical South America: South Brazil.

VII. XYLIA, Benth.

Benth. et Hook. Gen. Pl. i. 594.

I had not observed the glands at the tips of the anthers, which usually fall off as soon as the flower opens. They are, however, rather large, on a long stipes. The genus must therefore be transferred from the Eumimoseæ to the Adenanthereæ.

1. X. DOLABRIFORMIS, *Benth.! in Hook. Journ. Bot.* iv. 417; *Bedd. Fl. Sylv.* t. 186.

Mimosa xylocarpa, Roxb.! Corom. Pl. i. 68, t. 100.
Acacia xylocarpa, Willd. Spec. iv. 1055.
Inga xylocarpa, DC.! Prod. ii. 439.
Mimosa Acle, Blanco, Fl. Filip. 738, ed. 2. 509.
Inga lignosa, Grah.! in Wall. Cat. Herb. Ind. n. 5278.
Inga dolabriformis, Grah.! *l. c.* n. 5279.

Hab. Tropical Africa, East India, and the Indian archipelago.

VIII. STRYPHNODENDRON, Mart.

Benth. et Hook. Gen. Pl. i. 590.

Leaflets mostly alternate in all the species except *S. coriaceum,* in which many of them are opposite, but not constantly so, as in *Piptadenia.*

1. S. CORIACEUM, *Benth.! in Mart. Fl. Bras. Mim.* Ramuli crassi, fusco-tomentelli. Pinnæ 2–3-jugæ; foliola 4–6 juga, oblique ovata, suborbiculata, subcordata, ¾-1½ pollicaria, demum coriacea, glabra. Corolla calyce pubescente duplo longior. Legumen 4–5-pollicare.

Hab. Tropical America: Brazil, prov. Bahia and Minas Geraes.

2. S. BARBATIMAM, *Mart.! Herb. Fl. Bras.* 117. Ramuli crassi, rufo-tomentelli.

Pinnæ 5–8 jugæ; foliola 6–8 juga, oblique ovata v. orbiculata, subtus basi sæpe barbata, $\frac{1}{4}$–$1\frac{1}{4}$-pollicaria. Corolla calyce glabro plus triplo longior. Legumen $2\frac{1}{2}$–3-pollicare.—*Fl. Bras. Mim.*

Acacia adstringens, Mart.! Reise, i. 548.

Mimosa Barba-de-Timam, Vell. Fl. Flum. Ic. xi. t. 7.

Hab. Tropical America: Brazil, prov. Minas Geraes and San Paolo.

3. S. POLYPHYLLUM, *Mart.! Herb. Fl. Bras.* 117. Ramuli crassi, pulveraceo-tomentelli. Pinnæ 15–20-jugæ; foliola 10–20-juga, oblique oblongo-elliptica, pubescentia v. villosa, 3–4-linearia. Corolla calyce glabro plus triplo longior. Legumen 4–5-pollicare.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro, Minas Geraes, San Paolo, and Goyaz.

4. S. ROTUNDIFOLIUM, *Mart.! Herb. Fl. Bras.* 117. Subglabrum. Pinnæ 5–8-jugæ; foliola 5–8-juga, oblique orbiculata, subtus pallida v. alba, subsemipollicaria. Corolla calyce triplo longior.—*Fl. Bras. Mim.*

S. discolor, Benth.! in Hook. Journ. Bot. iv. 342.

Hab. Tropical America: Brazil, prov. Bahia and Piauhy.

5. S. OBOVATUM, *Benth.! in Mart. Fl. Bras. Mim.* Glabrum. Pinnæ 10–15-jugæ; foliola 6–10-juga, oblique obovato- v. rhombeo-oblonga, 3–4-linearia, subtus pallida. Corolla calyce triplo longior. Legumen curvum, sub-4-pollicare.

Hab. Tropical America: Brazil, prov. Goyaz and Mattogrosso.

6. S. MICROSTACHYUM, *Pœpp. et Endl.! Nov. Gen. et Sp.* iii. 82. Ramuli teretes petiolique ferrugineo-puberuli. Pinnæ 5–7-jugæ; foliola 8–10-juga, oblique rhombeo-oblonga, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria, supra nitida, subtus glauca. Corolla puberula, calyce duplo longior.—*Fl. Bras. Mim.*

S. inæquale, Benth.! in Herb. Mus. Petrop.

Hab. Tropical America: North Brazil.

7. S. GUIANENSE, *Benth. in Mart. Fl. Bras. Mim.* Ramuli subteretes petiolique ferrugineo-tomentelli. Pinnæ 6–12-jugæ; foliola 8–10-juga, oblique ovali-oblonga, 4–5-linearia, supra nitida, nigricantia, subtus rufescentia. Corolla glabra, calyce subtriplo longior. Legumen rectum v. leviter incurvum.

Mimosa guianensis, Aubl. Pl. Gui. 938, t. 357.

Acacia guianensis, Willd. Spec. iv. 1061.

Piptadenia guianensis, Benth.! in Hook. Journ. Bot. iv. 335.

Hab. Tropical America: Cayenne.

8. S. FLORIBUNDUM, *Benth.! in Hook. Journ. Bot.* iv. 343. Ramuli angulati, novelli petiolique tomentelli. Pinnæ 12–15-jugæ; foliola 10–20-juga, oblique oblonga, subtus pallida, puberula, 2 rarius 3 lin. longa. Corolla puberula, calyce duplo longior. Legumen rectum v. leviter arcuatum, 4-pollicare.—*Fl. Bras. Mim.*

Acacia pulcherrima, Willd.! Spec. iv. 1061.

Mimosa pulcherrima, Poir. Dict. Suppl. i. 66.

Hab. Tropical America: Brazil, prov. Bahia, and on the Amazon and Rio Negro; British Guiana, *Schomburgk.*

9. S. ANGUSTUM, *Benth.! in Mart. Fl. Bras. Mim.* Ramuli teretiusculi, novelli petiolique tomentelli. Pinnæ 12–15-jugæ; foliola 15–20-juga, oblongo-linearia, subtus pallida, 2–2½-linearia. Corolla vix pubescens, calyce duplo longior.

Hab. Tropical America: North Brazil, near Barra do Rio Negro.

The four preceding species are very closely allied to each other, and may possibly prove to be forms only of one species.

IX. ADENANTHERA, Linn.

Benth. et Hook. Gen. Pl. i. 590.

Leaflets mostly alternate.

1. A. PAVONINA, *Linn. Spec.* 550. Subglabra. Pinnæ 2–5-jugæ; foliola 6–10-juga, ovata v. oblongo-elliptica, obtusissima v. emarginata, ¾–1½-pollicaria. Spicæ subsemipedales. Legumen falcatum, subpedale, 6–8 lin. latum. Semina undique coccinea.—*Wight, Illustr. Bot. Ind.* t. 84 (80); *Bedd. Fl. Sylv.* t. 46.

Hab. Tropical Asia: East India and the Archipelago, common; tropical Africa, but perhaps introduced, as it certainly is in the West Indies and other parts of tropical America, and possibly in tropical Australia.

2. A. MICROSPERMA, *Teijsm. et Binnend. in Nat. Tijdschr. Ned. Ind.* xxvii. 58. Pinnæ 4–6-jugæ; foliola 6–8-juga, inæquali-ovalia, basi acuta, apice obtusa, subtus glauca, ¾–1¼-pollicaria. Racemi confertiflori. Legumina sicca tortilia. Semina compressiuscula, miniata.

Hab. Java, *Teijsmann.*

I have not seen this plant. It is said to differ from *A. pavonina* in the form and size of the leaves, and smaller seeds. The dimensions given of the leaflets, however, are the usual ones of *A. pavonina.*

3. A. BICOLOR, *Moon, Cat.* 34 *ex Thw. Enum. Pl. Zeyl.* 98. Glabra. Pinnæ 1–3-jugæ; foliola 3–4-juga, ovata v. ovato-lanceolata, acutiuscula, ¾–1½-pollicaria. Spicæ 3–4-pollicares. Legumen valde contortum, 6–8 lin. latum. Semina dimidiate bicoloria coccinea et nigra.

Hab. Tropical Asia: Ceylon and Malacca.

4. A. ABROSPERMA, *F. Muell.! Fragm. Phyt. Austral.* v. 30.

Hab. Tropical Australia: Queensland.

This is the doubtful species from Gilbert's River, mentioned in Benth. Fl. Austral. ii. 299 as known only from an imperfect specimen, consisting of a leaf resembling those of *A. pavonina,* with detached pods, short and bulky, slightly falcate, with red and white seeds, like those of *A. bicolor.* It has since been again found during Hann's Expedition to Cape-York Peninsula; but the specimens sent are again fragmentary, and give no further data for characterizing the species.

The doubtful plant from Rovuma river, in tropical Africa, mentioned by Oliv. Fl. Trop. Afr. ii. 330, under *Adenanthera,* proves to be a *Cassia,* closely allied to, if not identical with, *C. abbreviata,* Oliv.

X. TETRAPLEURA, Benth.

Benth. et Hook. Gen. Pl. i. 590.

1. T. THONNINGII, *Benth.! in Hook. Journ. Bot.* iv. 345. Glabra. Pinnæ 5–8-jugæ; foliola multijuga, subsessilia, elliptico-oblonga, obtusa v. retusa, 5–7-linearia. Legumen obtusum, 6–10-pollicare, acute lateque 4-alatum.—*Oliv.! Fl. Trop. Afr.* ii. 330.

Adenanthera tetraptera, Schum. et Thonn. Beskr. Pl. Guin. 213.

Hab. Tropical Africa: Upper and Lower Guinea.

2. T. ANDONGENSIS, *Welw.*; *Oliv. Fl. Trop. Afr.* ii. 331. Glabra. Pinnæ 3–4-jugæ; foliola multijuga, distincte petiolulata, ovali-elliptica, obtusa v. retusa, 6–9 lin. longa. Legumen 4–5-pollicare, acutum, anguste 4-alatum.

Hab. Tropical Africa: Lower Guinea.

3. T. OBTUSANGULA, *Welw.*; *Oliv. Fl. Trop. Afr.* ii. 331. Legumen obtusum, clavato-tetragonum, exalatum. Cætera ignota.

Hab. Tropical Africa: Lower Guinea.

XI. GAGNEBINA, DC.

Benth. et Hook. Gen. Pl. i. 591.

1. G. TAMARISCINA, DC.!, Prod. ii. 432.

G. axillaris, DC.! *l. c.* et Mém. Lég. t. 64.
Mimosa tamariscina, Lam. Dict. i. 13.
Acacia tamariscina, Willd. Spec. iv. 1062.
Prosopis tamariscina, Spreng. Syst. Cur. Post. 165.
Mimosa pterocarpa,, Lam. Dict. i. 13.

Hab. Mauritius.

XII. PROSOPIS, Linn.

Benth. et Hook. Gen. Pl. i. 591.

Sectio 1. ADENOPIS.

Petala intus glabra. Ovarium glabrum. Legumen teres v. valde incrassatum, endocarpio intra mesocarpium fibrosum articulos subdistinctos circa semina formante. Species Asiaticæ, aculeis sparsis recurvis armatæ v. hinc inde inermes.

1. P. SPICIGERA, *Linn. Mant.* 18. Arborea v. fruticosa, glabra, glauca. Pinnæ 1–2-jugæ; foliola 6–12-juga, oblongo-linearia, $\frac{1}{4}$–$\frac{1}{2}$ poll. longa. Spicæ laxæ, 2–4-pollicares. Legumen 6–8-pollicare, subrectum, torulosum.—*Roxb.! Corom. Pl.* t. 63. *Bedd. Fl. Sylv.* t. 56. *Brand. For. Fl. Ind.* t. 25.

P. spicata, Burm. Fl. Ind. 102, t. 25. f. 3.
Adenanthera aculeata, Roxb.! Fl. Ind. ii. 37.
Mimosa cineraria, Linn. Spec. 1500 ad Plum. Ic. t. 2. f. 1.
Acacia cineraria, Willd. Spec. iv. 1057, W. et Arn.! Prod. Fl. Penins. 278.

Hab. Tropical and subtropical Asia: Western provinces of East India and Persia.

2. P. STEPHANIANA, *Kunth, in Steud. Nom. Bot.* Fruticosa, glabra, glauca. Pinnæ 3–6-jugæ; foliola 8–12-juga, oblongo-linearia, 2–3 lin. longa. Spicæ densæ, 1–1$\frac{1}{2}$-pollicares. Legumen crassissimum, ovoideum v. oblongum, rectum v. valde incurvum, subpollicare.

Mimosa Stephaniana, Bieb. Casp. 205, ex ejusd. Fl. Taur.-cauc. ii. 449.
Acacia Stephaniana, Willd. Spec. iv. 1088.
Lagonychium Stephanianum, Bieb.! Fl. Taur.-cauc. Suppl. 288. Deless. Ic. Sel. iii. t. 75.
Mimosa agrestis, Sieb.! in Spreng. Syst. ii. 206.
Acacia heterocarpa, Delile, Cent. Pl. Caill. 19, ex Deless. Ic. Sel. iii. 42.
Acacia persica, Sterler, Hort. Nymph. ex Steud. Nom. Bot. ed. 2.
Mimosa farcta, Russ. Nat. Hist. Alep. ii. 266, ex char.

Hab. East Mediterranean Region: Caucasus, Levant, Persia, Afghanistan, Cyprus extending to Egypt if the reference to Delile's plant be correct.

Sectio 2. ANONYCHIA.

Petala intus glabra. Ovarium villosum. Legumen teres, endocarpium fibrosum continuo inter semina septato. Species Africana inermis elongatis

3. P. OBLONGA, *Benth.! in Hook. Journ. Bot.* iv. 348. Arborea, [illegible]eæ, $\frac{3}{4}$–$1\frac{1}{2}$-Pinnæ 2-rarius 3-jugæ; foliola 5–11-juga, oblonga v. lanceolata, $\frac{1}{2}$–1-poll[illegible]pollicare, densæ, $1\frac{1}{2}$–3-pollicares. Legumen 3–4 poll. longum, $\frac{1}{2}$–1 poll. crassum.—*Oli*

Afr. ii. 331. [illegible]go and

Coulteria? africana, Guill. et Perr.! Fl. Seneg. 256.

P. lanceolata, Benth. in Hook. Journ. Bot. iv. 347. liorum

Anonychium lanceolatum, Schweinf. Rel. Kotsch. 7, t. 7. s 1–2

Entada? durissima, Baill. Adans. vi. 208. labri,

Hab. Tropical Africa: Upper Guinea, Nile land. [illegible]um. lde

Sectio 3. ALGAROBIA.

Petala intus apice lanata. Ovarium villosum. Legumen planum v. demum[illegible]s vexum, rarius subteres, rectum arcuatum v. annulatum, endocarpio intra mesocar[illegible] fibroso-carnosum articulos nuciformes distinctos circa semina formante. Species An[illegible] canæ, spinis axillaribus solitariis geminisve armatæ v. inermes.

4. P. JULIFLORA, *DC. Prod.* ii. 447. Arborea v. alte fruticosa, glabra v. puberu spinis axillaribus armata v. rarius inermis. Pinnæ 1–2-jugæ; foliola 6–30-juga, oblong v. linearia, variant lata et 2–8 lin. longa v. angusta et $\frac{1}{2}$–1-pollicaria, obtusa v. acutiuscula Spicæ 2–4-pollicares, densæ v. tenues et interruptæ. Legumen rectum arcuatum v. in annulum perfectum curvatum, primum planum, demum sæpius ad semina v. undique convexum v. valde incrassatum, rarius teres, extus inter semina lineis transversis depressum v. continuum; variat 2–6 poll. longum, 3–5 lin. latum.—*Fl. Bras. Mim.*

Mimosa juliflora, Swartz! Prod. 85, Fl. Ind. Occid. 986 (errore typogr. *piliflora*).

Acacia juliflora, Willd. Spec. iv. 1076.

Mimosa salinarum, Vahl! Ecl. iii. 35.

Desmanthus salinarum, Steud. Nom. Bot. ed. 1.

Acacia salinarum, DC. Prod. ii. 456.

Prosopis horrida, Kunth! Mim. 106, t. 33.

Prosopis dulcis, Kunth! Mim. 110, t. 34.

Algarobia dulcis, Benth.! Pl. Hartw. 13.

Prosopis inermis, H., B. et K. Nov. Gen. et Sp. vi. 306.

Acacia pallida, Willd. Spec. iv. 1059.

Mimosa pallida, Poir. Dict. Suppl. i. 65.

Prosopis pallida, H., B. et K. Nov. Gen. et Sp. vi. 309.

Acacia cumanensis, Will. Spec. iv. 1058.

Mimosa cumana, Poir. Dict. Suppl. i. 65.

Prosopis cumanensis, H., B et. K. Nov. Gen. et Sp. vi. 310.

Acacia diptera, Willd.! Enum. Hort. Berol. 1051.

Acacia flexuosa, Lag. Elench. Hort. Matr. Nov. Gen. et Sp. 16.

Prosopis flexuosa, DC. Prod. ii. 447; Hook. et Arn.! in Hook. Bot. Misc. iii. 203.

P. fruticosa, Meyen! Reise, i. 376.

Mimosa furcata, Desf. Cat. 180, ex Pers. Syn. ii. 263.

sv.! Journ. Bot. 1814, i. 67.
m, Lag. Elench. Hort. Matr. Nov. Gen. et Sp. 16.

2. T. ANDONGEN*trum*, DC. Prod. ii. 447.
foliola multijuga Willd. Spec. iv. 1059.
Legumen 4–5-p*ta*, Poir. Dict. Suppl. i. 65.
ngensis et *P. bracteolata*, DC.! Prod. ii. 447.
Hab. Tropic reng. Syst. ii. 326.

3. T. OBTUS*a*, Torr.! in Ann. Lyc. N. York, ii. 192, t. 2.
vato-tetragon*landulosa*, Torr. et Gr.! Fl. N. Amer. i. 399.
Hab. Tro*dorata*, Torr. in Frem. Rep. 313, t. 1, excl. fr.

Vest tropical and subtropical North and South America: very abundant from Benth. et Ayres and Chile, along the Andes, to Mexico and Texas, and frequently planted 1. G. sweet, somewhat pulpy fruit, known under the name of *Algarobo*. I have seen *G. axil*d specimens from Brazil, Guiana, nor from any part of the basin of the Upper *Mimos*on.

Acaci great variations in the breadth and size of the leaflets, the production or non-production of spines *Pros*fferent branches or at different ages of the same tree, and the multitudinous shapes assumed by the *Mi*in ripening, have occasioned the publication of an unusually large number of species, founded often *H*fragmentary specimens. I have in vain endeavoured to sort them into varieties of any thing approach-g to a marked character.

5. P. LIMENSIS, *Benth.! in Hook. Journ. Bot.* iv. 350. Pubescens, spinis axillaribus paucis armata. Pinnæ 2–3-jugæ; foliola 6–12-juga, parva, oblonga, obtusa. Spicæ densæ, sub-4-pollicares. Legumen rectum, subteres, $1\frac{1}{2}$–$2\frac{1}{2}$-pollicare.

Hab. Tropical America: Lima in Peru, *Mathews*, *Cuming*, n. 974.

Ramuli, petioli, spinæ et rachis pinnarum pubescentes. Spinæ paucæ, solitariæ v. geminæ, semipollicares, validæ. Foliola $1\frac{1}{2}$–$2\frac{1}{2}$ lin. longa, conferta, utrinque puberula. Glandulæ parvæ inter pinnas utriusque paris, minimæ inter foliola suprema, nonnunquam deficientes. Flores *P. juliflorœ* v. calyx proportione corollæ brevior. Legumen 5 lin. latum et crassum, inter semina nequaquam constrictum, endocarpio tamen ut in *P. juliflora*, circa semina in articulos nuciformes distinctos secedente.

It will require a better series of specimens than we possess to determine whether this be really more than a local variety of *P. juliflora*.

6. P. DENUDANS, *Benth.! in Hook. Journ. Bot.* iv. 351. Puberula, spinis axillaribus validis brevibus. Pinnæ 1-jugæ; foliola 2–3-juga, linearia, 1–3 lin. longa. Spicæ oblongæ. Antheræ eglandulosæ. Legumen compressum, contorto-arcuatum, $1\frac{1}{2}$-pollicare, 3 lin. latum.

Hab. Extratropical South America: Patagonia, Port Desire, *Middleton*; Port St. Elena, *King*.

Frutex humilis, ramis crassis brevibus flexuosis. Spinæ conicæ, demum fere pollicares, in ramulis floridis multo breviores. Stipulæ fere obsoletæ. Foliorum petiolus communis 2–3 lin. longus, pinnarum raches vix longiores. Foliola crassiuscula, novella utrinque pubescentia. Spicæ $\frac{1}{2}$–1-pollicares, pedunculo 3–4-lineari fultæ, rachi pubescente. Flores siccitate nigricantes, extus glabri. Calyx parvus. Petala $1\frac{1}{4}$ lin. longa, intus apice lanata. Stamina breviter exserta, antheris in alabastro eglandulosis.

Notwithstanding the absence of the anther-glands, apparently constant in the present species and nearly so in the following one, the fruit and other characters refer them both, without doubt, to the section

Algarobia of *Prosopis*. The endocarp appears in both to form articles quite distinct, although sometimes contiguous.

7. P. HUMILIS, *Gill.! in Hook. Bot. Misc.* iii. 204. Glabra, spinis axillaribus elongatis striatis. Folia nulla v. ad petiolum 1–2-foliolatum reducta. Spicæ cylindraceæ, $\frac{3}{4}$–$1\frac{1}{2}$-pollicares. Antheræ vix glandulosæ. Legumen compressum, falcatum, 3–4-pollicare, 4–5 lin. latum.

Hab. Extratropical South America: Pampas of Buenos Ayres, *Gillies*; San Jago and Patagonia, *Tweedie*.

Fruticulus subaphyllus, spinis sæpe pollicaribus ramulisque rigidis sulcato-striatis insignis. Foliorum petiolus dum adest 2–3 lin. longus, apice biaristatus, et supra glandulam parvam foliola ferens 1–2 minima, lanceolata, acutissima. Spinæ sæpius geminæ, v. altera in spicam mutata. Flores extus glabri, calyce minimo, petalis $1\frac{1}{2}$ v. fere 2 lin. longis, intus apice lanatis. Ovarium subsessile, villosissimum. Antheræ sæpius eglandulosæ, interdum glandulam minutam sessilem detexi. Legumen immaturum valde compressum, marginibus incrassatis, demum utrinque convexum, subtorulosum.

8. P. SERICANTHA, *Gill.! in Hook. Bot. Misc.* iii. 204.—Puberula, aphylla, ramulis erectis rigidis plerisque apice subspinescentibus. Spicæ cylindraceæ, subsessiles, densæ, 1–$1\frac{1}{2}$-pollicares. Flores extus hirsuti. Calyx $\frac{1}{2}$ lin., petala $1\frac{1}{2}$ lin. longa. Antheræ distincte glanduliferæ. Legumen rectiusculum, compressum, demum utrinque convexum, 3–4-pollicare, 4 lin. latum.

Hab. Extratropical South America: Province of San Luis.

Species dubia.

9? P. HETEROPHYLLA, *Benth.! in Hook. Lond. Journ.* v. 82. Glabra, inermis. Stipulæ obsoletæ. Foliorum petiolus longus, complanatus. Pinnæ ad apicem 1–2-jugæ, foliolis 12–15-jugis parvis, v. nullæ. Spicæ subsessiles. Legumen planum, rectum, $4\frac{1}{2}$-pollicare, 5 lin. latum.

Hab. Extratropical North America; Sonora alta in Mexico, *Coulter*.

Ramuli tenues, subteretes, albidi. Foliorum petiolus communis 3–7 poll. longus, linea paullo latior v. angustior, quasi phyllodineus, nunc nudus apice obtusus, nunc summo apice pinnas 2, rarius 4, 1–$1\frac{1}{2}$-pollicares ferens. Glandulæ obscuræ inter pinnas et inter foliola summa. Foliola crassiuscula, 1–2-nervia, 2 lin. longa, acutiuscula, glabra v. pilis raris conspersa. Flores non vidi. Spicæ fructiferæ rhachis $1\frac{1}{2}$-pollicaris. Legumen adhuc immaturum tenue, reticulatum.

This very anomalous species was described from a single specimen in the herbarium of Trinity College, Dublin, which I have not since seen. It seems doubtful whether it be a *Prosopis* or an *Acacia*; but it appeared most to resemble in general habit some of the southern species of the former genus.

Sectio 4. STROMBOCARPA.

Petala intus apice lanata (excepta *P. striata*). Ovarium villosum. Legumen crassum, cochleato-contortum v. gyris numerosis spirale, endocarpio vario (in articulos distinctos v. subconnexos incrassato v. continuo v. vix a mesocarpio distincto). Frutices Americani. Stipulæ spinescentes basi sæpe connatæ. Spinæ axillares desunt.

A. Gray proposes to reduce the section or genus *Strombocarpa* strictly to those species in which the endocarp is continous, or scarcely distinguishable from the mesocarp, referring *P. torquata* and *P. abbreviata* to *Algarobia*; but the pod of the latter species is exactly intermediate between the irregularly spiral, almost jointed pod, with distinctly articled endocarp, of *P. torquata*, and the closely spiral one with continuous endocarp of *P. strombulifera*; and in other characters, especially in the stipular not axillary

spines, and the general form of the pod, the line of distinction between the two sections appears much more definite by including *P. torquata* in *Strombocarpa*.

* *Spicæ cylindraceæ v. ovoideæ.*

10. P. TORQUATA, *DC. Prod.* ii. 448. Puberula v. glabrata. Pinnæ 1-jugæ; foliola 15–25-juga, linearia, lineam longa. Legumen subcompressum, 3–4 lin. latum, irregulariter laxeque subspiraliter tortum, margine exteriore inter semina valde intruso submoniliforme, endocarpio in articulos nuciformes circa semina distincto.

Acacia torquata, Lag. Elench. Hort. Matr. Gen. et Sp. Nov. 16.

Hab. Extratropical South America; prov. San Louis, *Gillies*.

Frutex ramulis flexuosis foliisque minute viscido-puberulis glabrisve. Spinæ stipulares in ramulis hornotinis et in gemmis floriferis minimæ, in ramis vetustioribus validæ, rectæ, divaricatæ, semipollicares v. paullo longiores, basi connatæ. Foliorum petiolus communis vix linea longior, inter pinnas glandulifer. Pinnæ subpollicares, rachi eglandulosa v. inter foliola superiora glandula minuta instructa. Flores non vidi. Spicæ fructiferæ e gemmis axillaribus foliosis oriundæ, rachi $1\frac{1}{2}$-pollicari. Legumen interdum gyris 2–3 laxe spirale, sæpe extensum et valde irregulariter contortum.

11. P. ABBREVIATA, *Benth. in Hook. Journ. Bot.* iv. 352. Puberula v. glabrata. Pinnæ 1-jugæ; foliola 10–15-juga, oblonga, vix lineam longa. Spicæ ovoideæ. Legumen spiraliter contortum, gyris 7–8 laxis v. nonnullis v. omnibus arcte confertis, endocarpio inter semina subdistincto.

Hab. Extratropical South America, San Jago, *Tweedie*.

Frutex elegans ramosissimus, ramulis flexuosis. Spinæ stipulares geminæ, divaricatæ, pleræque parvæ, hinc inde fere $\frac{1}{2}$ poll. longæ. Folia in gemmis axillaribus fasciculata, petiolo communi vix lineam longo; glandulæ inter pinnas minutæ. Pinnæ 6–9 lin. longæ, ut videtur eglandulosæ. Foliola obtusissima, crassiuscula. Pedunculi sub spica semipollicares; spicæ ovoideæ rarius fere globosæ, rhachi semipollicari. Flores extus pubescentes, calyce fere semilineari, corolla lineam longa. Antherarum glandula stipitata. Ovarium stipitatum, villosissimum.

The pod in this species appears variable, sometimes almost as closely spiral as in the following species, sometimes with some of the spires very loose and almost interrupted between the seeds.

12. P. PUBESCENS, *Benth. in Hook. Lond. Journ.* v. 82. Cano-pubescens v. demum glabrata. Pinnæ 1-jugæ; foliola 5–8-juga, oblonga v. obovata, 3–4-linearia. Spicæ $1\frac{1}{2}$–2-pollicares, laxæ. Flores extus glabri. Legumen spirale, gyris 12–20 in cylindrum $1\frac{1}{2}$-pollicarem arcte confertis.

Strombocarpa pubescens, A. Gray! Pl. Wright. i. 60.

Prosopis Emoryi, Torr.! in Emory, Rep. 139.

Hab. Extratropical North America: Texas, Mexico, California.

The fruit figured under *P. odorata*, by Torr. in Frem. Rep. t. 1, is, according to A. Gray, Bot. Whipple Exped. 26, that of *P. pubescens*, which had been sent with the foliage of *P. juliflora*.

** *Spicæ exacte globoso-capitatæ.*

13. P. STROMBULIFERA, *Benth. in Hook. Journ. Bot.* iv. 352. Glaberrima. Pinnæ 1-jugæ; foliola 4–6-juga, oblongo-linearia, 1–$1\frac{1}{2}$ lin. longa. Capitula in pedunculo pollicari semipollicem diametro. Legumen spirale, gyris ad 10 in cylindrum pollicarem v. longiorem 3–4 lin. diametro arcte confertis.

Mimosa strumbulifera, Lam. Dict. i. 15.

Acacia strombulifera, Willd. Spec. iv. 1055.

Mimosa circinalis, Cav. Ic. vi. 41, in adnot.

Hab. Extratropical South America: Andes of Menoza, *Gillies*, *Bacle*.

The original misspelling of the specific name with an *u* instead of an *o* was owing to the French custom of pronouncing the *u* before an *m* in Latin words like an *o*.

14. P. REPTANS, *Benth. in Hook. Journ. Bot.* iv. 352. Minute puberula v. glabrata. Pinnæ 1-jugæ; foliola 6–10-juga, oblonga, linea breviora. Capitula quam in *P. strombulifera* minora. Legumen spirale, gyris ad 10 in cylindrum fere pollicarem 2–3-lin. diametro arcte confertis, endocarpio vix a mesocarpio distincto.

Hab. Extratropical South America: Cordova, *Tweedie*, called *Mostworta*, and used as a cure for dysentery.

Fruticulus humilis, e radice repente adscendens v. erectus, ramosissimus. Ramuli striati, uti folia minute viscido-puberuli mox glabrati. Stipulæ spinescentes tenues, nunc minimæ, nunc 3–5 lin. longæ. Foliorum petiolus communis vix lineam longus, inter pinnas glandulifer. Pinnæ 3–4 lin. longæ. Foliola conferta, obtusissima. Pedunculi 9–10 lin. longi. Flores extus glabri. Calyx semilineam vix excedens, corolla 1½ lin. longæ. Antherarum glandula stipitata.

15. P. CINERASCENS, *A. Gray*. Fruticulus *P. reptanti* simillimus, nec distinguendus nisi pube evidentiore præsertim in pedunculis et interdum in floribus ipsis, et foliolis paullo majoribus et 1½ lin. longis.

Strombocarpa cinerascens, A. Gray! Pl. Wright. i. 61.

Mimosa calcarea, Buckl. in Proc. Amer. Acad. 1861, 453; 1863, 162, ex A. Gray.

Hab. Extratropical North America: Texas and Mexico, *Berlandier*, n. 2013, 3143, *Gregg*, *Emory*.

Species dubia.

16. P. STRIATA, *Benth. in Hook. Lond. Journ.* v. 83. Fruticosa? Glabra. Ramuli crassi, striati, apice attenuato-spinescentes. Stipulæ parvæ, spinescentes, recurvæ, basi subconnatæ. Folia pauca, petiolo communi brevissimo. Pinnæ 1-jugæ; foliola 2–3-juga, oblonga, ad 2 lin. longa. Spicæ globosæ, parvæ, pedunculo tenui. Corolla membranacea, glabra. Antheræ glanduliferæ. Ovarium villosum. Legumen ignotum.

Hab. Extratropical South America: Port St. Elena in Patagonia, *King*.

The corolla in this species is rather more that of a *Mimosa* than of a *Prosopis*; but the habit, the glanduliferous anthers, etc. are those of *Prosopis*. Till the fruit has been seen, however, the genus must remain uncertain.

XIII. XEROCLADIA, Harv.

Benth. et Hook. Gen. Pl. i. 591.

X. ZEYHERI, *Harv.! Fl. Cap.* ii. 278. Fruticulus rigide ramosissimus. Stipulæ recurvæ, spinescentes. Folia pauca, parva. Capitula parva globosa.

Acacia viridiramis, Burch.! Trav. i. 300.

Hab. Extratropical South Africa.

XIV. DICHROSTACHYS, DC.

Benth. et Hook. Gen. Pl. i. 592.

Gland usually only between the lowest pair of pinnæ, rarely between all.

1. D. TENUIFOLIA, *Benth.! in Hook. Journ. Bot.* iv. 353. Ramuli et petioli pubes-

centi-hirti. Pinnæ 5–6-jugæ; glandulæ parvæ subsessiles v. 0; foliola multijuga, anguste linearia, ad 2 lin. longa. Spicæ globosæ densæ, pedunculo infra spicam nudo v. interrupte paucifloro. Legumen sublignosum, pubescens, 2–3-pollicare, 3–4 lin. latum, marginibus valde incrassatis.

Mimosa bicolor, Hels. et Boj.! MS.

Hab. Madagascar, *Bojer* (in flower), *Pervillé* (in fruit).

2. D. PLATYCARPA, *Welw. Apont.* 576. Ramuli et petioli pubescenti-hirti. Pinnæ 10–18-jugæ; glandulæ parvæ, stipitatæ; foliola multijuga, anguste linearia, ad 2 lin. longa. Spicæ cylindraceæ. Legumen $\frac{3}{4}$–$1\frac{1}{4}$ poll. latum.—*Oliv.! Fl. Trop. Afr.* ii. 333.

Hab. Tropical Africa: Upper and Lower Guinea.

This and the preceding species are readily distinguished from all others by the narrow leaflets.

3. D. CINEREA, *Wight et Arn.! Prod.* 271. Puberula. Pinnæ 8–10-jugæ; glandulæ sæpius breviter stipitatæ (interdum sessiles?); foliola multijuga, oblongo-linearia, $\frac{1}{2}$–1 lin. longa. Spicæ cylindraceæ. Flores parvi. Legumen 3, rarius 4 lin. latum.—*Wight, Ic.* t. 357; *Bedd. Fl. Sylv.* t. 185.

Mimosa cinerea, Linn. Spec. 1505; Roxb.! Corom. Pl. ii. 39, t. 174.

Desmanthus cinereus, Willd. Spec. iv. 1048.

Acacia cinerea, Spreng. Syst. iii. 143.

Acacia Dalea, Desv.! Journ. Bot. 1814, i. 69.

Hab. Tropical Asia: East-Indian Peninsula.

This and the following species are certainly, as observed by Oliver, very closely allied; but the Peninsular specimens appear to me to have always much smaller leaflets and flowers, and a narrower pod than *D. nutans*, and the glands of the common petiole are usually less stipitate.

Desmanthus callistachys, DC. Prod. ii. 445, described from a cultivated specimen from the Courrant garden in Teneriffe, which I did not find, or overlooked, in De Candolle's herbarium, is distinguished by the gland being sessile. I should therefore be disposed to refer it rather to the *D. cinerea* than to *D. nutans*. It is too shortly characterized for further identification.

4. D. NUTANS, *Benth.! in Hook. Journ. Bot.* iv. 353. Puberula v. glabrescens. Pinnæ 5–12-jugæ; glandulæ stipitatæ; foliola multijuga, oblongo-linearia, 2–3, rarius 4 lin. longa. Spicæ cylindraceæ. Legumen 4–5 lin. latum.—*Oliv.! Fl. Trop. Afr.* ii. 333.

Mimosa nutans, Pers. Syn. ii. 266.

Desmanthus nutans, DC.! Prod. ii. 446.

Mimosa sanguinea (*Ergell y Dimmo*), Bruce, Trav. vii. 147, 148, t. 6.

Mimosa bicolor, Schum.! et Thonn. Beskr. Pl. Guin. 326.

Caillea dichrostachys, Guill. et Perr.! Fl. Seneg. i. 240.

Desmanthus trichostachys, DC.! Prod. ii. 445, Mém. Lég. t. 67.

Desmanthus leptostachys, DC.! Prod. ii. 445.

Desmanthus divergens, Willd. Spec. iv. 1048.

Mimosa divergens, Poir. Dict. Suppl. i. 59.

Acacia spinosa, E. Mey.! Comm. Pl. Afr. Austr. 170.

Acacia adenostylis, Fenzl! in Flora, 1844, 312.

Dichrostachys caffra, Meissn.! in Pl. Krauss. exs. n. 166.

D. callistachys, Hassk. Pl. Jav. Rar. 415.

D. cinerea, Miq.! Fl. Ind. Bat. i. pars i. 48 quoad plantam javanicam; Benth.! Fl. Austral. ii. 299.

Piptadenia stenadenia, Griseb.! Cat. Pl. Cub. 81.

Hab. Tropical Africa, apparently common throughout, extending into extratropical

South-east Africa as far as Natal; tropical Asia; the Indian archipelago; tropical Australia. For if the African and Indian-peninsular species are really distinct, as they appear to be, it is certainly to the former, not to the latter, that the Javan and Australian specimens should be referred.

5. D. Forbesii, *Benth. ! in Hook. Journ. Bot.* iv. 353. Glabriuscula. Pinnæ 3–4-jugæ; glandulæ stipitatæ; foliola 10–15-juga, oblongo-linearia, 2–3 lin. longa. Spicæ cylindraceæ, breves.—*Harv. ! et Sond. Fl. Cap.* ii. 278.

Hab. Extratropical South-east Africa: Delagoa Bay, *Forbes.*

6. D. Muelleri, *Benth. ! Fl. Austral.* ii. 299. Glabra. Pinnæ 1–2-jugæ, petiolo tenui; foliola 4–6-juga, oblongo-linearia, 3–5 lin. longa. Spicæ cylindraceæ.

Neptunia spicata, F. Muell. ! Fragm. Phyt. Austral. iii. 151.

Hab. Tropical Australia.

7. D. Kirkii, *Benth.*, sp. n. Cano-puberula, mox glabrata. Pinnæ 1-jugæ; foliola 3–5-juga, oblonga v. obovali-oblonga, obtusissima, coriacea, 1–2 lin. longa. Spicæ oblongæ.

Hab. Tropical Africa: Brava on the Somali coast, *Kirk.*

Frutex ramis rigidis tortuosis albidis, ramulis spinescentibus. Partes novellæ pube brevi alba conspersæ v. canescentes. Folia parva, siccitate nigricantia, adulta fere glabra; petiolus communis vix lineam longus, pinnarum rhaches tenues, 2–3 lin. longæ. Spicæ breviter pedunculatæ, ante anthesin oblongæ, 2–3 lin. longæ, per anthesin vix semipollicares. Flores inferiores more generis steriles, filamentis elongatis in sicco purpureis. Stamina florum hermaphroditorum multo breviora etsi corolla plus duplo longiora. Legumen ignotum.

XV. Neptunia, Lour.

Benth. et Hook. Gen. Pl. i. 592.

* *Capitula absque staminodiis ovoidea, floribus neutris numerosis staminodiis elongatis fere hemisphærica. Stamina v. staminodia* 10.

1. N. oleracea, *Lour. Fl. Cochinch.* 654. Glabra. Caulis natans, radicans, sæpe spongioso-inflatus. Pinnæ 2–3-jugæ; foliola 8–20-juga, linearia, 4–6 lin. longa. Legumen subpollicare, 4 lin. latum, a stipite 3-lineari deflexum.—*Fl. Bras. Mim.*; *Oliv. ! Fl. Trop. Afr.* ii. 334.

Mimosa natans, Vahl, Symb. iii. 102; Roxb. ! Corom. Pl. t. 119.
Desmanthus natans, Willd. Spec. iv. 1044.
Mimosa prostrata, Lam. Dict. i. 10.
Mimosa lacustris, Humb. et Bonpl. ! Pl. Æquin. i. 55. t. 16.
Acacia lacustris, Desf. Cat. Hort. Par. 301.
Desmanthus lacustris, Willd. Spec. iv. 1044.
Mimosa aquatica, Pers. Syn. ii. 263.
Desmanthus stolonifer, DC. ! Prod. ii. 444.
Neptunia stolonifera, Guill. et Perr. ! Fl. Seneg. 239.
N. plena, Lindl. ! Bot. Reg. 1846, t. 3, excl. syn.

Hab. Tropical Asia, Africa, and America, very widely dispersed in tranquil waters, but perhaps in some localities introduced.

2. N. plena, *Benth. ! in Hook. Journ. Bot.* iv. 355. Prostrata v. adscendens, ramosa, glabra. Pinnæ 2–3-jugæ; foliola 14–20-juga, linearia, 4–6 lin. longa. Bracteæ in medio

pedunculo 2, alternæ, cordatæ, quam in cæteris speciebus majores diutiusque persistentes. Legumen subsesquipollicare, 4–5 lin. latum, a stipite brevi deflexum.—*Fl. Bras. Mim.*

Mimosa plena, Linn. Spec. 1502.
Desmanthus plenus, Willd. Spec. iv. 1045.
Mimosa punctata, Linn. Spec. 1502.
Acacia punctata, Desf. Cat. Hort. Par. 300.
Desmanthus punctatus, Willd. Spec. iv. 1047.
Desmanthus polyphyllus, DC.! Prod. ii. 444.
Neptunia polyphylla, Benth. in Hook. Journ. Bot. ii. 129.
Mimosa adenanthera, Roxb. Fl. Ind. ii. 554.
Desmanthus adenanthera, Wall. Cat. Herb. Ind. n. 5298.
Mimosa lycopodioides, Desf. in Pers. Syn. ii. 263.
Acacia lycopodioides, Desv.! Journ. Bot. 1814, pars i. 68.
Neptunia surinamensis, Steud.! in Flora, 1843, 759.

Hab. Tropical America: Brazil, Paraguay, Ecuador, Guiana, West Indies, Central America; also Tropical Asia, but probably introduced.

The plant figured as *N. plena*, Bot. Reg. 1846, t. 3, described as having a spongy floating stem, was probably the *N. oleracea*.

** *Capitula globosa v. ovoidea, floribus inferioribus neutris v. masculis paucis* (*v.* 0 ?). *Stamina* 10.

3. N. TRIQUETRA, *Benth. in Hook.! Journ. Bot.* iv. 355. Diffusa, glabriuscula. Pinnæ 2–3-jugæ; foliola 6–12-juga, linearia, $1\frac{1}{2}$–2 lin. longa. Capitula globosa. Flores inferiores pauci neutri. Legumen $\frac{1}{2}$–1-pollicare, 3–4 lin. latum, a stipite brevi deflexum.—*Fl. Bras. Mim.*

Mimosa triquetra, Vahl, Symb. iii. 102.
Desmanthus triqueter, Willd. Spec. iv. 1045. Wight, Ic. t. 756.

Hab. Tropical Asia: East-Indian Peninsula. Entered in the Flora Brasiliensis on account of a specimen in the Berlin Herbarium from Sello's South-Brazilian collection. Possibly there may have been some mistake. It is quite distinct from any American species.

4. N. TENUIS, *Benth.! in Hook. Journ. Bot.* iv. 355. Glabriuscula, diffusa, ramis tenuibus. Pinnæ 2–4-jugæ; foliola 10–15-juga, oblongo-linearia, ad 2 lin. longa. Capitula ovoidea v. oblonga. Flores inferiores pauci masculi. Legumen longe stipitatum.

Desmanthus lacustris, Torr. et Gr.! Fl. N Amer. i. 402.

Hab. Extratropical North America: Texas.

5. N. LUTEA, *Benth.! in Hook. Journ. Bot.* iv. 356. Pubescens, prostrata, ramis elongatis. Pinnæ 3–5-jugæ, petiolo eglanduloso; foliola 15–20-juga, linearia, ad 2 lin. longa. Capitula ovoidea. Flores inferiores masculi perpauci. Legumen ultrapollicare, ad 5 lin. latum, a stipite longiusculo subdeflexum.

Acacia lutea, Leavenw. in Sillim. Journ. vii. 61 ex Torr. et Gr.! Fl. N. Amer. i. 403.

Hab. Extratropical North America: Texas and Arkansas.

6. N. PUBESCENS, *Benth.! in Hook. Journ. Bot.* iv. 356. Pubescens, prostrata, ramis elongatis. Pinnæ 2–3-jugæ; glandula obscura v. nulla; foliola 20–30-juga, linearia, ad

2 lin. longa. Capitula ovoideo-globosa. Flores inferiores pauci masculi. Legumen breviter nunc brevissime stipitatum.

Hab. Tropical and northern subtropical America: Paraguay, *Weddell*; Lima and other parts of the Peruvian coast, *Dombey*, *Cuming*, n. 1027, and others; Costarica, *Œrsted*; St. Domingo, *Schomburgk*; Dominica, *Imray*; Key-west, Florida, *Rwegel*, n. 206 (distributed as *Acacia lutea*), and apparently also Texas, *Wright*, n. 157, *Berlandier*, n. 2021, *Emory Expedition*, n. 303. The species may, however, prove to be a variety of *N. lutea*, distinguished chiefly by its much smaller flower-heads and the stipes of the pod scarcely ever above 1 line long.

**** Capitula globosa, floribus inferioribus neutris v. masculis perpaucis v. nullis. Stamina* 5.

7. N. GRACILIS, *Benth.! in Hook. Journ. Bot.* iv. 355. Procumbens v. adscendens, glabra v. puberula. Pinnæ 1–2-jugæ; foliola 6–20-juga, oblongo-linearia, 2–3 lin. longa. Pedunculi 1–3-pollicares. Legumen oblongum, 4–6-spermum.—*Benth. Fl. Austral.* ii. 300.

Hab. Tropical and eastern subtropical Australia.

8. N. MONOSPERMA, *F. Muell. in Benth. Fl. Austral.* ii. 300. Glabra. Pinnæ 2–3-jugæ; foliola 20–30-juga, oblongo-linearia, 2–3 lin. longa. Pedunculi infra-semipollicares. Ovarium 2-ovulatum. Legumen suborbiculatum, monospermum, 3–4, rarius 5 lin. latum.

Hab. Tropical Australia: N. coast, also N.W. coast, *A. Cunningham.*

Neptunia acinaciformis, Miq. Fl. Ind. Bat. i. pars i. 51 (*Desmanthus acinaciformis*, Span. in Linnæa, xv. 198; *D. pusillus*, Zippel), from Timor, is insufficiently described for identification. The number of stamens is not mentioned. If the flowers are pentandrous, it may be the same as the *Neptunia gracilis*.

Desmanthus trispermus, Span. in Linnæa, xv. 198, also from Timor, is named only, without any character, and must therefore be cancelled as a species.

XVI. DESMANTHUS, Willd.

Benth. et Hook. Gen. Pl. i. 592.

The herbaceous or suffruticose species of this genus run very much one into another; and probably a careful study of better specimens than we possess of some of them may induce a considerable reduction of their number. It is doubtful how far the size of the petiolar gland, or the exact proportions in length and breadth and shape of the pod may be constant. The shrubby *D. arborescens*, from Madagascar, is, however, a remarkable exception.

1. D. VIRGATUS, *Willd. Spec.* iv. 1047. Glabriusculus, erectus v. decumbens. Pinnæ 1–7-jugæ; glandula majuscula; foliola 10–20-juga, oblongo-linearia, 2–3 lin. longa. Capitula pauciflora. Stamina 10. Legumen rectum v. subfalcatum, 2-pollicare v. longius, $1\frac{1}{2}$–$1\frac{3}{4}$ lin. latum.—*Oliv. Fl. Trop. Afr.* ii. 334.

Mimosa virgata, Linn. Spec. 1502; Jacq. Hort. Vind. t. 80.

Acacia virgata, Gærtn. Fruct. ii. 317, t. 148.

Mimosa angustisiliqua, Lam. Dict. i. 10.

Acacia angustisiliqua, Desf. Cat. Hort. Par.! 300.

Desmanthus strictus, Bertol.! in DC. Prod. ii. 445.

D. leptophyllus, H., B. et K. Nov. Gen. et Sp. vi. 264.

Mimosa pernambucana, Mill.! Dict. n. 3, et auct. plur. an Linn.?
Acacia depauperata, Mart.! in Steud. Nom. Bot. ed. 2.

Hab. Tropical and subtropical America: common from Buenos Ayres to the West Indies; tropical Asia: probably introduced into East India.

2. D. DEPRESSUS, *Humb. et Bonpl. in Willd. Spec.* iv. 1046. Glabriusculus, diffusus. Pinnæ 1–5-jugæ; glandula parva; foliola 10–20-juga, linearia, sæpius angusta, ad 2 lin. longa. Capitula pauciflora. Stamina 10. Legumen rectum v. subfalcatum, 2-pollicare v. longius, ad $1\frac{1}{2}$ lin. latum, seminibus numerosis obliquis.—*Fl. Bras. Mim.*; *Kunth, Mim.* 115, t. 35.

Mimosa depressa, Poir. Dict. Suppl. i. 58.
Mimosa pernambucana, Linn. Spec. 1052, pro parte?
Desmanthus diffusus, Willd. Spec. iv. 1046?
Desmanthus pratorum, Macfad.! Fl. Jam. i. 311.
D. tenellus, DC.! Prod. ii. 445.

Hab. Tropical and subtropical America: from South Brazil and Peru to Guiana, Columbia, the West Indies, South Florida, Texas? and Central America.

It is not always easy to distinguish this from *D. virgatus*. It appears that both are sometimes procumbent; but *D. depressus* is more so, with smaller, narrower leaflets, and a much smaller gland. I have found 10 stamens in all the flowers I have examined.

3. D. LEPTOLOBUS, *Torr. et Gr.! Fl. N. Amer.* i. 402. Glabriusculus. Pinnæ 6–10-jugæ; glandula parva sæpius minuta; foliola 15–25-juga, anguste linearia, 1–$1\frac{1}{2}$ lin. longa. Capitula pauciflora. Stamina 5. Legumen rectum, 2–3-pollicare, 1 lin. latum. Semina dissita, sublongitudinalia, 2 lin. longa.

Hab. Extratropical North America: Texas and Arkansas.

This is the only long-fruited species in which I have found only 5 stamens. It may therefore have been this one that Linnæus first described as *Mimosa pernambucana*, although Gouan and others of his correspondents gave that name to the decandrous *D. depressus*. The leaflets of *D. leptolobus*, like those of *D. brachylobus*, are still narrower than in *D. depressus*.

4. D. VELUTINUS, *Scheele in Linnæa*, xxi. 455. Molliter pubescens, prostratus v. adscendens. Pinnæ 3–6-jugæ; glandula parva, nunc minuta; foliola 10–20-juga, oblongo-linearia, avenia. Capitula parvula (ad 3 lin. diametro). Stamina 10, legumen elongatum, rectum v. fere rectum, acuminatum, $1\frac{1}{2}$ lin. latum.

D. pedunculatis, Buckl. in Proc. Acad. Philad. 1861, 454; 1862, 163.

Hab. Extratropical North America: Texas. The pod is said to attain 3 or 4 inches. I have not seen it above $2\frac{1}{2}$ in. long.

5. D. JAMESII, *Torr. et Gr.! Fl. N. Amer.* i. 402. Leviter puberulus, prostratus v. ascendens. Pinnæ 3–6-jugæ; glandula magna, oblonga; foliola 10–20-juga, linearioblonga, subavenia. Capitula majuscula (4–5 lin. diametro absque staminibus). Stamina 10. Legumen elongatum, rectum v. rectiusculum, obtusum v. acutum.

Hab. Extratropical North America: Texas and adjoiniug districts.

With much of the foliage of *D. reticulatus*, this is known by the larger flower-heads, and especially by the large oblong gland just below the lowest pair of pinnæ.

6. D. RETICULATUS, *Benth.! in Hook. Journ. Bot.* iv. 357. Parce pubescens, glaucescens, diffusus. Pinnæ 1–4-, sæpius 2–3-jugæ; glandula parva v. nulla; foliola

4–8-juga, oblonga, 1½-linearia, 2–3-nervia. Capitula parva. Stamina 10. Legumen subfalcatum, acutum, reticulato-venosum, 1–1½ poll. longum, 1¼–1½ lin. latum, 8–13-spermum.

D. rhombifolius, Buckl. in Proc. Acad. Philad. 1861, 454; 1862, 163.

Hab. Extratropical North America: Texas, *Drummond.*

Nos. 140 and 169 of Wright's Texan plants appear to me to be a variety of this species, with the veins of the leaflets less prominent underneath, and the pod altogether larger, and perhaps rather less veined. They have certainly neither the larger flower-heads nor the conspicuous oblong petiolar gland of *D. Jamesii*.

7. D. ACUMINATUS, *Benth.! in Hook. Journ. Bot.* iv. 357. Pubescens v. glabriusculus, diffusus. Pinnæ 1–4-jugæ; glandula majuscula; foliola 6–10-juga, oblonga. Capitula pauciflora. Stamina 10. Legumen falcatum, acuminatum, læve, 1½-pollicare, 1½ lin. latum, 8–13-spermum.

Hab. Extratropical North America: Texas, *Drummond.*

8. D. INCURVUS, *Benth.! in Hook. Lond. Journ.* v. 84. Glabriusculus, diffusus. Pinnæ 5–10-jugæ; foliola 10–15-juga, oblonga; glandula parva v. nulla. Capitula pauciflora. Stamina 10. Legumen falcatum, 2–2½ lin. latum, hirtellum, 6–9-spermum.

Hab. Subtropical North America: between Real del Monte and Zacatecas in Mexico, *Coulter.*

This seems to connect the preceding with the following species. *Mimosa pumila*, Schlecht. in Linnæa, xii. 557, from Regla, *Ehrenberg*, is probably, from the description, the same species, or one closely allied to it.

9. D. BRACHYLOBUS, *Benth.! in Hook. Journ. Bot.* iv. 358. Glabriusculus, erectus. Pinnæ 6–15-jugæ; Foliola 20–30-juga, anguste linearia, 1–2 lin. longa. Glandula parvula. Capitula multiflora. Stamina 5. Legumen late falcatum, ½–1-pollicare, 3 lin. latum, 3–6-spermum.

Acacia brachyloba, Willd. Spec. iv. 1071.
Darlingtonia brachyloba, DC.! Prod. ii. 443.
Mimosa glandulosa, Mich. Fl. Bor. Amer. ii. 254; Vent. Choix, t. 27.
Acacia glandulosa, Willd. Spec. iv. 1071.
Darlingtonia glandulosa, DC. Prod. ii. 443.
Mimosa illinoensis, Mich. Fl. Bor. Amer. ii. 254.
Darlingtonia intermedia, Torr. in Ann. Lyc. N. York, ii. 181.
Mimosa contortuplicata, Zuccagni! Obs. Hort. Flor. n. 100, ex DC.
Desmanthus falcatus, Scheele in Linnæa, xxi. 455.

Hab. Extratropical North America: Southern United States.

With the numerous fine leaflets and pentandrous flowers of *D. leptolobus*, the pod is the shortest and broadest, instead of the longest and narrowest of the genus. It is still, however, that of a *Desmanthus*, and not of a *Neptunia*.

10. D. ARBORESCENS, Bojer! MS. Fruticosa, glabra v. pilis raris conspersa. Pinnæ 1-jugæ; foliola 4–6-juga, oblongo-linearia, 2–3 lin. longa. Capitula multiflora. Stamina 5. Legumen rectum, obtusum, 2–3-pollicare, 2–3 lin. latum, basi longe angustatum. Semina longitudinalia.

Hab. Madagascar: Bombatok Bay, *Bojer.*

Ramuli lignosi, elongati, ut videtur divaricati v. diffusi. Stipulæ angustæ, setaceo-acuminatæ, 1–1½

lin. longæ, caducæ. Foliorum petiolus communis 1–2 lin. longus, tenuis; pinnarum rhaches subsemipollicares, fere filiformes. Foliola rigidula, valde oblique pennivenia, venis 2–3 infimis ad basin costæ insertis. Pedunculi ad nodos ramorum annotinorum solitarii, tenues, pollicares v. paullo longiores. Capitula globosa, diametro vix 2 lineas excedentia staminibus exclusis. Calyx truncatus, ½ lin. longus. Petala 5, fere a basi soluta, calyce duplo longiora. Stamina in floribus examinatis 5, corolla dimidio longiora. Antheræ oblongæ, glandula minuta fugacissima (an semper?) apiculatæ. Ovarium glabrum. Legumen glaberrimum, rigidulum, marginibus incrassatis fere *Calliandræ*, valvis coriaceis nitidis aveniis. Semina 6–8, oblonga, inter se distantia.

XVII. Mimosa, Linn. (pro parte).

Benth. et Hook. Gen. Pl. i. 593.

Since I proposed the division of this vast genus into three sections or subgenera, I have seen the ripe fruits of many species in which it was then unknown; and the distinction between the transversely articulate and continuous valves, which I had already been obliged to give up in respect of some species of the group *Meticulosæ* of *Eumimosa*, has entirely broken down also for the separation of the section *Ameria* from *Habbasia*. In some cases the pod (within the constantly continuous persistent margin) is articulate or not, according to circumstances, in the same species; in other cases the character would widely dissever species otherwise closely allied. The group of *Spicifloræ* have the very flat pod, with numerous articles broader than long, of many true *Habbasiæ*, with the marginal prickles prevalent in *Ameria*, and the isomerous stamens of *Eumimosa*. I have therefore been obliged to reduce the number of primary sections to two, distinguished solely by the number of stamens, equal to or twice that of the divisions of the corolla—a character which I have found absolutely constant, except perhaps in a single species (*M. scabrella*). This consolidation of *Habbasia* and *Ameria*, and the new lights thrown upon many species by the numerous additional specimens brought under examination, as well as a considerable number of new species, have occasioned several modifications in the subordinate groups I had proposed. It may be therefore useful to prefix to the detailed enumeration of species the following general summary of the groups or series, neglecting occasional exceptions, to be specially mentioned in the course of the enumeration.

Sect. 1. Eumimosa. *Stamina numero petalorum æqualia.*—Species 1–130.

Series 1. *Sensitivæ.* Pinnæ 1-jugæ. Foliola majuscula, 1½–2-juga. Aculei sparsi v. 0.—Species 1–13.

Series 2. *Modestæ.* Pinnæ 1-jugæ. Foliola pauci- (4–5-)juga. Aculei infrastipulares v. 0. Herbæ diffusæ v. nanæ.—Species 14–18.

Series 3. *Castæ.* Pinnæ 1-jugæ. Foliola pluri- (sæpius multi- rarius 3–6-)juga. Aculei sparsi.—Species 19–32.

Series 4. *Pectinatæ.* Pinnæ 1-jugæ. Foliola multi- (rarius 6–8-)juga. Aculei nonnulli v. omnes infrastipulares. Frutices v. suffrutices elatiores.—Species 33–38.

Series 5. *Pudicæ.* Pinnæ 2–5-jugæ, sæpius confertæ. Foliola multijuga, marginata. Aculei nonnulli v. omnes infrastipulares.—Species 39–45.

Series 6. *Hirsutæ.* Pinnæ 2–4-jugæ, rarius unijugæ. Foliola multijuga, 3–5-nervia, immarginata. Inermes, patentim pilosæ, pedunculis longis.—Species 46–53.

Series 7. *Pedunculosæ.* Pinnæ 1-jugæ, rarius 2–4-jugæ. Foliola multijuga (rarius 5–8-juga), marginata. Inermes, diffusæ v. prostratæ, pedunculis sæpius axillaribus elongatis.—Species 54–66.

Series 8. *Meticulosæ.* Pinnæ 1-jugæ. Foliola multijuga (rarius 4–8-juga), marginata. Inermes, rigidæ v. fruticosæ, pedunculis sæpius brevibus in racemum seu paniculam terminalem dispositis, v. infimis axillaribus.—Species 67–100.

Series 9. *Myriophyllæ.* Pinnæ multijugæ. Foliola multijuga, parva. Inermes, rigidæ v. fruticosæ, capitulis globosis in racemum terminalem dispositis v. infimis axillaribus.—Species 101–103.

Series 10. *Spicifloræ*. Pinnæ pluri- v. multi-jugæ. Spicæ cylindraceæ v. elongatæ. Aculei sparsi parvi. Flores sæpius 5-meri.—Species 104–109.

Series 11. *Obstrigosæ*. Pinnæ 1-jugæ. Fruticuli inermes v. parce aculeati, pilis deorsum appressis strigosi rarius glabri.—Species 110–116.

Series 12. *Lepidotæ*. Pinnæ 1- pluri-jugæ. Frutices inermes, tomento stellato plumoso v. lepidoto, flavicantes canescentes v. fulvescentes.—Species 117–130.

Sect. 2. HABBASIA. *Stamina numero petalorum duplo plura*.—Species 131–278.

* *Setæ nullæ* (*sp. 2 exceptis*).

Series 1. *Leptostachyæ*. Spicæ cylindraceæ densæ v. laxifloræ.—Species 131–160.

Series 2. *Glanduliferæ*. Capitula parva, globosa, ample paniculata. Legumen planum, pluriarti-

Slip to be stitched in at p. 389.

Owing to an accidental clerical error, the specific numbers referred to in this Clavis of the Sect. HABBASIA are 1 too low when above 150, thus:—

131–278	should	be	131–279
131–160	,,	,,	131–161
161–167	;,	,,	162–168

and so on.

setosum, valvis indivisis. Frutices inermes, setosi.—Species 268–278.

All the series of both sections are American; the few species of the genus indigenous to the Old World belong to the series *Rubicaules* and *Asperatæ* of *Habbasia*.

Sectio 1. EUMIMOSA.

Stamina numero petalis æqualia.—Herbæ, suffrutices v. frutices, interdum scandentes, rarissime arborescentes, sæpe setosi. Foliorum petiolus (duabus speciebus exceptis) eglandulosus. Pinnæ sæpius 1-jugæ v. jugis digitatim approximatis rarius dissitis pluri-jugæ. Foliola pauci- v. multi-juga, dum paucijuga foliolum interius paris infimi sæpius multo minus v. deficiens. Capitula in seriebus plerisque globosa v. rarius elliptica, in seriebus 10ma et 12ma spicæ oblongæ v. elongato-cylindraceæ. Calyx minutus subinconspicuus v. paleaceo-ciliatus aut pappiformis. Corolla membranacea v. in serie 12ma crassior, 4-fida v. in serie 10ma 5-fida, rarius 3- v. 6-fida. Legumen sæpius oligospermum

Series 10. *Spicifloræ*. Pinnæ pluri- v. multi-jugæ. Spicæ cylindraceæ v. elongatæ. Aculei sparsi parvi. Flores sæpius 5-meri.—Species 104–109.

Series 11. *Obstrigosæ*. Pinnæ 1-jugæ. Fruticuli inermes v. parce aculeati, pilis deorsum appressis strigosi rarius glabri.—Species 110–116.

Series 12. *Lepidotæ*. Pinnæ 1- pluri-jugæ. Frutices inermes, tomento stellato plumoso v. lepidoto, flavicantes canescentes v. fulvescentes.—Species 117–130.

Sect. 2. Habbasia. *Stamina numero petalorum duplo plura*.—Species 131–278.

* *Setæ nullæ* (*sp. 2 exceptis*).

Series 1. *Leptostachyæ*. Spicæ cylindraceæ densæ v. laxifloræ.—Species 131–160.

Series 2. *Glanduliferæ*. Capitula parva, globosa, ample paniculata. Legumen planum, pluriarticulatum. Frutices sæpe scandentes, aculeis minimis recurvis. Foliorum petiolus glandulifer.—Species 161–167.

Series 3. *Rubicaules*. Capitula globosa, sæpius paniculata. Legumen planum, pluriarticulatum. Frutices aculeis sparsis armati rarius setis rigidis echinati. Foliorum petiolus eglandulosus.—Species 168–190.

Series 4. *Acanthocarpæ*. Capitula globosa, pleraque axillaria. Legumen planum, valvis indivisis v. rarius articulatis. Frutices aculeis sparsis v. infrastipularibus armati.—Species 191–213.

Series 5. *Ephedroideæ*. Capitula globosa, lateralia. Legumen planum (pluriarticulatum?). Fruticuli spinescentes, aphylli v. foliis parvis raris.—Species 214, 215.

Series 6. *Stipellares*. Capitula globosa, axillaria. Legumen subplanum, valvis indivisis. Frutices inermes v. rarius parce aculeati, non setosi. Stipellæ orbiculatæ v. ovatæ.—Species 216–224.

Series 7. *Leptopodæ*. Capitula globosa, axillaria. Legumen planum, valvis articulatis. Frutices inermes, non setosi. Stipellæ minutæ v. setaceæ. Foliola parva v. 0.—Species 225–239.

** *Sæpissime setosæ*.

Series 8. *Somniantes*. Capitula globosa, pleraque racemosa. Corollæ multistriatæ. Frutices v. herbæ aculeati v. inermes, setosi hispidi v. glabri. Petiolus inter pinnas setifer.—Species 240–249.

Series 9. *Asperatæ*. Capitula globosa, axillaria v. racemosa. Corollæ membranaceæ non striatæ. Frutices v. herbæ aculeati v. subinermes, hispidi v. setosi. Petiolus inter pinnas sæpius setifer. Legumen planum, valvis articulatis.—Species 250–265.

Series 10. *Adversæ*. Capitula globosa, racemosa. Legumen subplanum, valvis indivisis. Frutices suffruticesve aculeis sursum incurvis armati.—Species 266, 267.

Series 11. *Pachycarpæ*. Capitula globosa, conferta v. racemosa. Legumen sæpius crassiusculum, setosum, valvis indivisis. Frutices inermes, setosi.—Species 268–278.

All the series of both sections are American; the few species of the genus indigenous to the Old World belong to the series *Rubicaules* and *Asperatæ* of *Habbasia*.

Sectio 1. Eumimosa.

Stamina numero petalis æqualia.—Herbæ, suffrutices v. frutices, interdum scandentes, rarissime arborescentes, sæpe setosi. Foliorum petiolus (duabus speciebus exceptis) eglandulosus. Pinnæ sæpius 1-jugæ v. jugis digitatim approximatis rarius dissitis plurijugæ. Foliola pauci- v. multi-juga, dum paucijuga foliolum interius paris infimi sæpius multo minus v. deficiens. Capitula in seriebus plerisque globosa v. rarius elliptica, in seriebus 10ma et 12ma spicæ oblongæ v. elongato-cylindraceæ. Calyx minutus subinconspicuus v. paleaceo-ciliatus aut pappiformis. Corolla membranacea v. in serie 12ma crassior, 4-fida v. in serie 10ma 5-fida, rarius 3- v. 6-fida. Legumen sæpius oligospermum

(in serie 10ma polyspermum) valvis in articulos secedentibus v. in paucis speciebus indivisis, margine setoso v. nudo, nec simplici serie aculeato.

Series 1. Sensitivæ. *Herbæ perennes erectæ v. scandentes, rarius annuæ v. frutices. Pinnæ unijugæ. Foliola bijuga, majuscula, basi dimidiata, marginibus nerviformibus et appresse ciliatis rarius nudis; interius paris infimi minimum basi æquale v. deficiens. Pedunculi inferiores axillares, superiores in racemum terminalem sæpius dispositi. Capitula globosa. Flores* 4*-meri v. rarius hinc inde pauci* 5*-meri. Legumen planum, valvis in articulos distinctos secedentibus.*

1. M. Velloziana, *Mart.! Herb. Fl. Bras.* 185. Subscandens, glabra. Aculei sparsi, recurvi. Foliola ovato-lanceolata, acutata, glabra v. subtus strigis paucis conspersa, majora sesquipollicaria. Legumen subpollicare, ad 4 lin. latum, glabrum, margine setosum. *Fl. Bras. Mim.*

M. viva, Vell. Fl. Flum. Ic. xi. t. 33, non Linn.

Var. *jiramenensis,* foliolis majoribus, leguminis setis marginalibus minimis nec elongatis.

M. jiramenensis, Karst.! Fl. Colomb. ii. 59, t. 130.

Hab. Tropical America: Brazil, prov. Rio Janeiro, San Paolo, Goyaz and Bahia; North Brazil; Columbia, Panama, *Seemann*, *Fendler*, n. 91; Guatemala, *Bernoulli* (with the pods very slightly hoary pubescent when young); Guanaxuato, *Ærsted*; the variety *jiramenensis* in North Brazil and Columbia.

2. M. sensitiva, *Linn. Spec.* 1501. Subscandens, pubescens v. hirsuta. Aculei sparsi. Foliola ovato-lanceolata, acuta, subtus v. utrinque appresso-villosa, majora $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longa. Legumen sæpius $\frac{3}{4}$ poll. longum, 3 lin. latum, pubescens v. villosum, margine rigide ad facies parce setosum.—*Fl. Bras. Mim.*

M. floribunda, Benth.! in Hook. Journ. Bot. ii. 130, non Linn.

M. litigiosa et *M. malitiosa,* Mart.! Herb. Fl. Bras. 138.

Hab. Tropical America: Brazil, prov. Bahia, Minas Geraes, Pará and Rio Negro.

This, the preceding, and the three or four following species, pass so nearly one into the other that they would probably all have been included by Linnæus under his *M. sensitiva*; but the one he had specially in view, founded on the excellent figure and description of Breynius, Cent. 31. t. 16, is, without doubt, the common Brazilian acute-leaved villous one to which the name is here restricted.

3. M. albida, *Humb. et Bonpl. in Willd. Spec.* iv. 1030. Scandens, cano-pubescens. Aculei sparsi, rari. Foliola ovato-lanceolata, acutiuscula, utrinque minute cano-puberula, majora subsesquipollicaria. Legumen subpollicare, cano-pubescens et pilis rigidis appressis strigosum.—*Bonpl.! Mim.* 2. t. 1.

M. sensitiva, Lodd.! Bot. Cab. t. 249, et hortul. plur.

Hab. Tropical America: Pacific coast, Lima to Panama, *Humboldt and Bonpland*, *Dombey*, *Matthews*, n. 440, *Cuming*, n. 1025; Acapulco, *Sinclair*.

This is the species or variety which most commonly represents the *M. sensitiva* in our gardens.

4. M. floribunda, *Willd.! Spec.* iv. 1031. Subscandens, pubescens v. hirsuta. Aculei sparsi, recurvi. Foliola ovato-lanceolata, acutiuscula, supra glabra, subtus dense strigoso-villosa, majora subsesquipollicaria. Legumen subpollicare, ad 3 lin. latum, undique longe rarius breviter setosum.—*Hook. Ic. Pl.* t. 373.

M. strigosa, Willd. ! Spec. iv. 1030.
M. Willdenowii, Poir. Dict. Suppl. i. 50.
M. racemosa, Schlecht. Linnæa, xii. 557.

Hab. Tropical America: Ecuador, Bolivia, Peru, Columbia, Central America, Mexico, apparently common.

5. M. ADHÆRENS, *H., B. et K. ! Nov. Gen. et Sp.* vi. 249, a *M. floribunda* differre videbatur aculeis crebrioribus et foliolis obtusioribus ad illa *M. rixosæ* tendentibus. An hujus v. illius varietas ?

Hab. Tropical America: On the Orinoco, *Humboldt and Bonpland.*

6. M. RIXOSA, *Mart. ! Herb. Fl. Bras.*, 137. Subscandens, ferrugineo-hirsuta v. pubescens. Aculei sparsi, recurvi. Foliola obovato-oblonga, obtusa v. mucronata, utrinque adpresse villosa, majora $1\frac{1}{2}$–2-pollicaria. Legumen $\frac{3}{4}$-pollicare, 2–$2\frac{1}{2}$ lin. latum, margine rigide ad facies parce setosum.—*Fl. Bras. Mim.*

M. violacea, Bonpl. in Ten. Cat. Ort. Nap. 87 ex descr.
M. pauciseta, Benth. ! in Hook. Journ. Bot. iv. 362.

Hab. Tropical America: Brazil, prov. Minas Geraes and San Paolo.

7. M. PLATYPHYLLA, *Benth. ! in Hook. Lond. Journ.* v. 85. Suffrutiosa, inermis, setis rufis longis hirsutissima. Foliola oblique obovata, obtusa, utrinque hirsuta, majora 2–$2\frac{1}{2}$-pollicaria.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

8. M. DEBILIS, *Humb. et Bonpl. ! in Willd. Spec.* iv. 1029. Annua dicitur etsi pluripedalis, erecta v. debilis, pubescens v. hirsuta. Aculei parvi, rari. Foliola obovali-oblonga, obtusa, utrinque appresse pilosa, majora rarius pollicaria. Legumen semipollicare, 2 lin. latum, undique dense longeque v. brevius setosum.—*Fl. Bras. Mim.*

M. Hostmanni, Benth. ! in Hook. Lond. Journ. v. 84.
M. notata, Steud. ! in Flora, 1843, 758.

Hab. Tropical America: North Brazil, Surinam, Columbia.

Var. ? *panamensis.* Annua v. suffruticosa ? tenuis. Aculei validi, recurvi, crebri. Foliola quam in forma typica angustiora, majora $\frac{3}{4}$ poll. longa supra medium 3 lin. lata. Capitula parva et legumina omnino formæ typicæ.

Hab. Panama, *Seemann.*

9. M. OBTUSIFOLIA, *Willd. Spec.* iv. 1047. Herbacea v. suffruticosa, glabra v. parce setosa. Aculei sparsi, recurvi, pauci. Foliola obovato-oblonga, obtusa, majora vix ultrapollicaria, supra glaberrima, subtus sparse strigosa.—*Fl. Bras. Mim.*

M. fervida, Mart. ! Herb. Fl. Bras. 137, 185.

Hab. Tropical America: Brazil, prov. Minas Geraes and San Paolo.

10. M. GLAUCESCENS, *Benth. ! in Hook. Journ. Bot.* iv. 362. Suffruticosa, glaberrima, glauca, inermis. Foliola obovali-oblonga, obtusa, coriacea, margine nerviformi serrato-ciliato cincta, majora $1\frac{1}{2}$–2-pollicaria. Legumen 1–$1\frac{1}{4}$-pollicare, 3–$3\frac{1}{2}$ lin. latum, glaberrimum, nudum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz or Minas Geraes.

11. M. ANGUSTA, *Benth. ! in Hook. Journ. Bot.* iv. 362. Suffruticosa, glaberrima,

glauca, inermis. Foliola oblongo-linearia, acuta v. mucronata, margine nerviformi pauciciliato, majora 1–1½-pollicaria, 2–3 lin. lata. Bracteæ corolla breviores.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

12. M. NUDA, *Benth.! in Hook. Journ. Bot.* iv. 362. Suffruticosa, glaberrima, glauca, inermis. Foliola oblonga, obtusiuscula, margine nerviformi nudo, majora 1½–2-pollicaria, 4–8 lin. lata. Legumen subpollicare, 2 lin. latum, crassiusculum, nudum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz; Chiquitos in Bolivia, *D'Orbigny*.

13. M. GYMNOLOMA, *Benth.! in Hook. Lond. Journ.* v. 85. Suffruticosa, glaberrima, glauca, inermis. Foliola linearia, margine nerviformi nudo, majora 2–3-pollicaria. Bracteæ corollam superantes.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

Series 2. Modestæ. *Herbæ prostratæ v. decumbentes, sæpius annuæ v. nanæ, inermes v. aculeis infrastipularibus infrafoliaceisque armatæ. Pinnæ unijugæ. Foliola paucijuga, latiuscula, margine nerviformi setuloso-ciliato cincta v. nuda. Pedunculi solitarii v. gemini, inferiores axillares, superiores sæpe racemosi. Capitula globosa. Flores 4-meri. Leguminis articuli sæpius medio tuberculosi v. echinati.*

The plants of this series differ from the *Pectinatæ* in their small or weak herbaceous often annual habit, from the *Castæ* in the want of the scattered prickles, and from these as well as from the other following series in their fewer leaflets. *M. honesta,* among the *Meticulosæ,* approaches the *Modestæ* in habit as in the pod, but upon the whole seems better placed among the former.

14. M. VIVA, *Linn.! Spec.* 1500. Nana, tenella, diffusa v. reptans, glabra, inermis. Foliorum petiolus communis filiformis, ½–1-pollicaris; pinnæ petiolo breviores; foliola sub-4-juga, obovato-oblonga, vix 2 lin. longa. Capitula pauciflora, pedunculo filiformi petiolo æquilongo. Legumen ovato-quadratum, 1-spermum, pubescenti-hirtum.

Hab. Tropical America: Jamaica.

15. M. SKINNERI, *Benth.! in Hook. Lond. Journ.* v. 85. Annua? diffusa, humilis, pilis longis rufis patentibus hirsuta. Aculei gemini v. terni, infrastipulares et infrafoliacei, recti. Foliola 4–5-rarius 6–8-juga, obovato-oblonga, supra glabra, subtus pilosa, ad 3 lin. longa. Pedunculi filiformes, 1–1½-pollicares. Leguminis articuli 3–4, stellato-pubescentes, margine setosi.

Hab. Tropical America: Guatemala, Cuesta of Leone, *Skinner*; Ujara, *Œrsted.*

This species has the rather more numerous leaflets of the *Castæ*; but the habit and prickles are those of the *Modestæ.* Although small, the plant is much larger and coarser than the *M. viva.*

16. M. DESMODIOIDES, *Benth.! in Mart. Fl. Bras. Mim.* Herbacea, prostrata, gracilis, glabra v. pauciseta. Aculei infrastipulares gemini v. 0. Foliola sub-4-juga, obovato-oblonga, obtusa, membranacea, immarginata, 2½–3 lin. longa. Pedunculi tenues, pollicares longioresque. Legumen sæpius falcatum, 6–8 lin. longum, 1½ lin. latum, faciebus dense, marginibus parce setosis, articulis sæpius 4.

Hab. Tropical America: Brazil, prov. Goyaz.

17. M. MODESTA, *Mart.! Herb. Fl. Bras.* 135. Suffruticosa v. herbacea, decumbens, puberula v. apice sericeo-pilosa. Aculei infrastipulares gemini v. 0. Foliola 4–5-juga,

ovata v. obovata, coriacea, glabra, margine nerviformi setoso-ciliato, 4–5 lin. longa. Pedunculi 1½–3-pollicares. Legumen ½–1-pollicare, 3–4 lin. latum, tomentoso-canescens, articulis 2–4 medio aculeis conicis echinatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia.

18. M. URSINA, *Mart.! Herb. Fl. Bras.* 136. Herbacea, decumbens v. suberecta, patentim pilosa. Aculei gemini v. terni, infrastipulares et infrafoliacei. Foliola 4–5-juga, ovata, subcoriacea, supra glabra, subtus longe hirsuta, 4–6-linearia. Pedunculi infrapollicares. Legumen ½–¾-pollicare, fere 3 lin. latum, molliter appresse pubescens, articulis 2–4 medio aculeis conicis echinatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia and Piauhy.

Series 3. Castæ. *Frutices suffrutices v. herbæ, aculeis sparsis nec infrastipularibus armatæ (v. hinc inde subinermes). Pinnæ unijugæ. Foliola pluri- v. multijuga, margine nerviformi setuloso-ciliato cincta v. nuda. Pedunculi solitarii v. gemini, axillares folioque breviores v. ad apices ramorum racemosi. Capitula globosa v. rarius oblonga. Flores tetrameri. Leguminis valvæ articulatæ v. indivisæ, nudæ v. setosæ nec tuberculoso-incrassatæ.*

This series is intermediate, as it were, between the *Sensitivæ* and the *Meticulosæ*, the *M. casta* and its allies having the habit of the former but differing in the more numerous leaflets, and the *M. dolens* and its allies differing from the *Meticulosæ* only in the presence of prickles, which in a few specimens are exceedingly few, or perhaps sometimes entirely wanting, although a careful search has almost always pointed out some small ones, which I have never found in any of the numerous species of *Meticulosæ*.

* *Foliola 3–6-juga, margine nerviformi cincta.*

19. M. CASTA, *Linn. Spec.* 1500. Fruticosa, debilis v. subscandens, subglabra. Aculei recurvi, crebri. Foliola oblonga v. lanceolata, 3–5-nervia, glabra v. subtus parce setulosa, majora subpollicaria. Legumen ¾–1½-pollicare, 4–5 lin. latum, margine setoso, valvis glabris nudis 3–5-articulatis.—*Fl. Bras. Mim.*

M. dominiciana, Desv.! in Ann. Sc. Nat. ser. 1, ix. 424.

Hab. Tropical America: North Brazil, West Indies.

20. ? M. HETEROCARPA, *Presl, Bot. Bemerk.* 64. Fruticosa, scandens? subglabra. Aculei sparsi, recurvi. Foliola 4-juga, ovato-lanceolata, acuta, 3-nervia, subtus strigosa. Legumina alia 5-linealia elliptica 1-sperma disco inermia, alia 2–3plo longiora, in articulos 2–3 disco echinatos monospermos secedentia.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

I have seen no specimen answering to the character given; and as the flowers were unknown to Presl, it is uncertain even to which section of the genus the plant should be referred. The habit described is nearest to that of *M. casta*.

21. ? M. LACTIFLUA, *Delile! in Herb. DC.* Fruticosa? glabra. Aculei sparsi, rari, recti. Foliola 4–5-juga, oblique ovata v. oblonga, rigidula, pennivenia. Capitula iis *M. castæ* majora, cui cæterum affine.—*Fl. Bras. Mim.*

Hab. America tropica?

Delile's specimens were from the Botanical Garden of Montpellier, supposed to be of American, perhaps Brazilian, origin. In the Berlin herbarium there is a specimen from Mexico, *Ehrenberg*, which agrees

with the detailed description I had made (now inserted in the Flora Brasiliensis), except that the leaflets are under instead of over $\frac{1}{2}$ in. long. I have now no means of comparing the specimens themselves. The straight rare prickles, the rigid leaflets, &c. prevent the uniting it with the *M. casta*.

** *Foliola* 6- *multijuga, submembranacea, vix marginata.*

22. M. TRICEPHALA, *Cham. et Schlecht.! in Linnæa*, v. 591. Fruticosa, pubescenti-scabra. Aculei recti. Foliola 10–15-juga, ovato-oblonga, semipollicaria, 1–2-nervia, supra glabra, subtus strigosa. Legumen ignotum.

Hab. Tropical North America: Mexico, near Actopan, *Schiede*.

23. M. SAGOTIANA, *Benth.! in Mart. Fl. Bras. Mim.* Scandens? glabra. Aculei recurvi, copiosi. Foliola 12–20-juga, oblongo-linearia, falcata, 2–3-nervia, subsemipollicaria, membranacea, glabra. Legumen pollicare v. longius, 5–6 lin. latum, marginibus breviter, faciebus sparse setosis, cæterum glabrum, pluriarticulatum.

Hab. Tropical America: North Brazil, *Pœppig*; Cayenne, *Sagot*, n. 1063.

Nearly allied to *M. schrankioides*, of which Sagot considered it a glabrous variety, differing from it in about the same degree that the *M. Velloziana* does from *M. sensitiva*. Besides the want of hairiness, the venation of the leaflets seems distinct, and the pod much larger.

24. M. SCHRANKIOIDES, *Benth.! in Hook. Lond. Journ.* v. 86. Scandens? hirsuta. Aculei recurvi, copiosi. Foliola 12–20-juga, oblongo-linearia, falcata, 1-nervia, subtus præsertim villosa, subsemipollicaria, membranacea. Legumen $\frac{1}{2}$–$\frac{3}{4}$-pollicare, 2 lin. latum, tomentosum, marginibus setoso-aculeatis, faciebus parce setosis, articulis 3–4.

Hab. Tropical America: British Guiana, *Rob. Schomburgk*, 2nd coll. n. 470; *Rich. Schomburgk*, n. 765; Columbia, Tovar, *Fendler*, n. 2244; Puerto Cabello, *Moritz*.

Rami elongati, hirsuti, striis aculeisque *Schrankiam* referentes. Stipulæ subulatæ. Foliorum petiolus communis subsesquipollicaris, aculeatus. Pinnæ petiolo sublongiores, rhachi pariter aculeata. Foliola acutiuscula, vix tenuiter marginata, parce ciliata, utrinque subtus præsertim molliter villosa, costa valida, additis interdum nervis 1–2 lateralibus tenuibus brevibus, nec distincte ut in *M. Sagotiana* 2–3-nervia. Pedunculi hirsuti, $\frac{1}{2}$–1-pollicares, in racemum terminalem dispositi. Capitula parva. Bracteæ longe ciliatæ, ultra corollam haud prominentes. Calyx minutus, longe ciliatus. Corolla tenuis, vix lineam longa. Stamina 4, elongata. Ovarium villosulum.

25. M. TRICHOCEPHALA, *Benth.! in Mart. Fl. Bras. Mim.* Herbacea, rufo-pilosa. Aculei recurvi, rari. Foliola 6–10-juga, oblonga, membranacea, ciliata, glabra, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria. Bracteæ capillaceo-acuminatæ, alabastra longe superantes. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

26. M. RAMOSISSIMA, *Benth. in Mart. Fl. Bras. Mim.* Fruticosa, rufo-pilosa. Aculei recurvi. Foliorum petiolus brevissimus. Foliola 12–20-juga, oblongo-linearia, membranacea, $1\frac{1}{2}$–3 lin. longa. Bracteæ corolla breviores. Calyx quam in affinibus multo magis evolutus. Legumen $\frac{3}{4}$-pollicare, $2\frac{1}{2}$ lin. latum, undique aculeato-setosum, valvis vix in articulos secedentibus.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

27. M. OBLONGA, *Benth.! in Hook. Journ. Bot.* iv. 365. Setoso-hispida. Aculei tenues, recurvi, rari. Foliorum petiolus brevissimus. Foliola 25–35-juga, linearia, $1\frac{1}{2}$–3

lin. longa. Capitula oblonga, ½-pollicaria, 2 lin. diametro. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical or subtropical South America: South Brazil.

28. M. STENOPTERA, *Benth.* Herbacea?, strigosa. Aculei sparsi, recti v. subrecurvi. Foliola 30–40-juga, 1½ lin. longa, coriacea. Capitula ovoidea. Legumen junius densissime setosum.

Hab. Subtropical South America: near Jujuy, in La Plata, *Pearce.*

Herba annua dicitur, 1–2-pedalis: ramus florifer tamen etsi tenuis, in sicco sublignosus apparet, pilis rigidis sursum appressis crebrisque strigosus, aculeis paucis. Foliorum petiolus communis 4–6 lin. longus; pinnæ unijugæ, 1½–2-pollicares. Foliola acutiuscula, parce ciliata. Flores *M. oblongæ*, capitula tamen ovoidea nec oblonga, parum longiora quam lata v. fere globosa. Calyx longe fimbriato-ciliatus, corollæ dimidium attingens. Legumen perfectum haud suppetit.

29. M. LUNDIANA, *Benth. ! in Mart. Fl. Bras. Mim.* Suffruticosa? tenuis, glanduloso-pubescens et setulosa. Aculei recurvi, minimi. Foliola 8–12-juga oblonga, subtus v. utrinque puberula, 3–4 lin. longa. Capitula globosa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. San Paolo.

*** *Foliola* 10- *multijuga, coriacea, margine nerviformi ciliato cincta.*

30. M. INSIDIOSA, *Mart. ! Herb. Fl. Bras.* 134. Fruticosa, retrorsum strigoso-scaberrima. Aculei recurvi. Foliola 12–20-juga, oblongo-linearia, 4–6 lin. longa. Legumen ¾-pollicare, 2½ lin. latum, margine dense aculeato setoso, valvis sparse setosis, 3–4-articulatis.—*Fl. Bras. Mim.*

M. retrorsa, Benth. ! in Hook. Journ. Bot. iv. 364.

Hab. Tropical America: Brazil, prov. Minas Geraes.

31. M. DOLENS, *Vell. Fl. Flum. Ic.* xi. t. 34. Suffruticosa, rigida, glanduloso-hirta. Aculei recti, validi v. minimi, nunc rari. Foliola 10–15-juga, oblonga, coriacea, glabra v. subtus strigosa, 6–8-linearia v. fere pollicaria. Legumen subsemipollicare, 2 lin. latum, undique setosum, valvis indivisis.—*Fl. Bras. Mim.*

M. meticulosa, var.? *major,* Mart. ! Herb. Fl. Bras. n. 1090.

Hab. Tropical America: Brazil, prov. Rio Janeiro, San Paolo, and Minas Geraes.

32. M. TRACHYCEPHALA, *Benth. ! in Mart. Fl. Bras. Mim.* Herbacea v. suffruticosa, rigida, strigoso-hispida, eglandulosa. Aculei recti, rari. Foliola 20–25-juga, oblonga, acuta, 4–5 lin. longa. Legumen semipollicare, 3 lin. latum, undique dense echinato-setosum, valvis 2-articulatis.

M. insidiosa, Benth. ! in Hook. Journ. Bot. iv. 365, non Mart.

Hab. Tropical America: Brazil, prov. Minas Geraes.

Series 4. Pectinatæ. *Frutices v. herbæ, rarius arborescentes, aculeis omnibus v. nonnullis infrastipularibus v. infrafoliaceis armati, additis interdum paucis sparsis. Pinnæ unijugæ. Foliola pluri- sæpius multijuga. Pedunculi solitarii v. 2–3ni, axillares v. ad apices ramorum racemosi. Capitula globosa. Flores 4-meri. Legumen ubi notum setosum v. hispidum, valvis articulatis.*

* *Foliola minima, conferta, glabra, coriacea.*

33. M. PECTINATA, *Kunth! Mim.* 5. t. 2. Arborea, dense strigosa. Aculei infrastipulares gemini, recti. Foliorum petiolus communis brevissimus; foliola 20–25-juga, linearia, coriacea, glabra, marginata, ciliata, 2 lin. longa. Pedunculi axillares. Legumen ignotum.

Hab. Tropical America: Andes of Guamana, near Quito, *Humboldt and Bonpland.*

34. M. ORTHACANTHA, *Benth.! in Hook. Journ. Bot.* iv. 365. Fruticosa, glabra. Aculei infrafoliacei v. infrastipulares, solitarii v. terni, recti. Foliorum petiolus communis brevissimus; foliola 8–10-juga, cuneato-oblonga v. linearia, 1–2½ lin. longa, immarginata, nuda. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. South Brazil, *Sello.* Only seen in the Berlin Herbarium.

** *Foliola oblonga, supra pubescentia, subtus villosa.*

35. M. XANTI, *A. Gray! in Proc. Amer. Acad.* v. 157. Fruticosa, cinereo-pubescens. Aculei infrastipulares recti, additis paucis sparsis. Foliorum petiolus communis ¼–½-pollicaris; foliola 6–9-juga, latiuscule oblonga, 3–4-linearia, submarginata, utrinque pubescentia. Capitula globosa. Flores pubescentes. Legumen ignotum.

Hab. Tropical North America: Cape San Lucas, California, *Xantus.*

36. M. BOLIVIANA, *Benth.* Fruticosa, ferrugineo-pubescens. Aculei infrastipulares recurvi. Foliola 20–30-juga, latiuscule oblonga, supra glabrescentia, subtus dense pilosa, 3–4-linearia, margine recurva. Pedunculi axillares. Legumen ignotum.

Hab. Tropical South America: Bolivia, *Kelly, Mandon*, n. 756.

Frutex videtur ramosissimus, ramis ferrugineo-pubescentibus. Aculei præter infrastipulares pauci, sparsi in ramulis petiolisque. Foliorum petiolus communis 2–4 lin. longus; pinnæ 2–3-pollicares. Foliola siccitate nigricantia, supra sæpe nitidula; pili paginæ inferioris rigidi, densi. Pedunculi 1–2-pollicares, dense rufo-pubescentes. Capitula globosa. Calyx longe ciliato-fimbriatus. Corolla apice strigillosa.

37. M. POLYCARPA, *Kunth! Mim.* 8. t. 3. Fruticosa, strigosa, ramulis tenuibus elongatis. Aculei infrastipulares gemini, recti, additis paucis sparsis. Foliola 20–70-juga, linearia, 3–5 lin. longa, utrinque pilosa. Legumen ½–1-pollicare, 2 lin. latum, margine longe setoso, valvis breviter strigosis glabrisve 3–4-articulatis.—*Fl. Bras. Mim.*

M. xanthocentra, Mart.! Herb. Fl. Bras. 130.

M. longipinna, Benth.! in Hook. Journ. Bot. iv. 366.

Hab. Tropical America: Brazil, prov. Piauhy, Minas Geraes, Goyaz, and Mattogrosso; Bolivia, *D'Orbigny*, n. 531; Peru, near Caxamarca, *Humboldt and Bonpland*; Ocaña in New Granada, *Schlim*, n. 173.

38. M. MANSII, *Mart.! Herb. Fl. Bras.* 130. Herbacea, decumbens. Aculei infrastipulares gemini, recti, additis paucis sparsis parvis. Foliola 20–40-juga, linearia, 2–4 lin. longa, supra glabra, subtus pilosa. Legumen lineare, margine strigoso-aculeato.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Mattogrosso.

Series 5. Pudicæ. *Frutices suffrutices v. herbæ, aculeis omnibus v. nonnullis infrastipularibus armati, additis interdum paucis sparsis; rarius hinc inde subinermes. Pinnæ*

2–4-jugæ, ad apicem petioli approximatæ subdigitatæ, v. rarius secus petiolum dissitæ, v. in foliis nonnullis ad par unicum reductæ. Foliola multijuga, margine nerviformi cincta. Pedunculi axillares, folio breviores, v. ad apices ramorum racemosi. Capitula globosa v. elliptica. Flores 4-meri. Legumen setosum v. hispidum, valvis in articulos secedentibus.

* *Pedunculi petiolo communi breviores v. subæquilongi.*

39. M. Glazioui, *Benth. ! in Mart. Fl. Bras. Mim.* Fruticosa, setoso-hispida. Pinnæ dissite 2-jugæ; foliola 12–20-juga, lineari-falcata, nitidula, 2–4-linearia. Pedunculi 3–5 lin. longi. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

40. M. pudica, *Linn. ! Spec.* 1501. Suffruticosa v. annua, pilosa v. glabrata. Pinnæ confertim 2-jugæ rarius 1-jugæ; foliola 15–25-juga, linearia, 3–5 lin. longa. Legumen 6–8 lin. longum, $1\frac{1}{2}$ lin. latum, inter semina sæpius contractum, margine setosum, faciebus glabris.—*Fl. Bras. Mim.*

a. forma hispidior:

M. pudica, Linn., Willd. Spec. iv. 1031.
– *M. tetrandra,* Humb. et Bonpl. in Willd. Spec. iv. 1032, ex descr.
– *M. hispidula,* H., B. et K. ! Nov. Gen. et Sp. vi. 252.
– *M. striato-stipula,* Steud. ! in Flora, 1843, 758.
– *M. hirsuta,* Moç. et Sess. in G. Don, Gen. Syst. ii. 383, ex char. (pinnis sæpius 1-jugis).

β. forma glabrior:

M. pudica, H., B. et K. ! Nov. Gen. et Sp. vi. 252.
– *M. pudibunda,* Willd. Spec. iv. 1032.
– *M. endymionis,* Mart. ! Herb. Fl. Bras. 131.
– *M. irritabilis,* Presl ! Bot. Bemerk. 64 (pinnis sæpius 1-jugis).
– *M. unijuga,* Duch. et Walp. ! in Linnæa, xxiii. 744 (pinnis sæpius 1-jugis).

Hab. Tropical America: a common weed in most parts of the region, naturalized also in many parts of tropical Africa and Asia.

41. M. polydactyla, *Humb. et Bonpl. ! in Willd. Spec.* iv. 1033. Suffruticosa, hirsuta v. subglabra. Pinnæ confertim 4–5-jugæ, rarius 3-jugæ; foliola 30–60-juga, linearia, iis *M. pudicæ* sæpius minora. Legumina fere *M. pudicæ*, sed sæpe in capitulo numerosissima, in massam globosam conferta, setis marginalibus fuscis v. flavicantibus dense echinata.—*Kunth ! Mim.* t. 5; *Fl. Bras. Mim.*

M. Glockeri, Meissn. ! Pl. Glock. Exs. n. 177.
M. 6-phylla, Salzm. Pl. Exs.

Hab. Tropical America: Brazil, prov. Bahia, Pernambuco, and Pará; Guiana, Columbia.

42. M. verecunda, *Benth. ! in Hook. Journ. Bot.* iv. 368. Suffruticosa, pubescens et reflexo-hispida. Aculei rari. Pinnæ subdissite 3-jugæ, rarius 2-jugæ; foliola 30–60-juga, linearia, 1–3 lin. longa. Legumen $\frac{3}{4}$-pollicare, 2–$2\frac{1}{2}$ lin. latum, margine longe setosum, faciebus sæpius breviter setosis pubescentibusve.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

** *Pedunculi petiolo communi multo longiores.*

43. M. DIGITATA, *Benth.! in Hook. Journ. Bot.* iv. 368. Fruticosa, scabro-pubescens v. villosa. Aculei parvi v. 0. Pinnæ confertim 3–4-jugæ; foliola 15–20-juga, linearia, 1–1½ lin. longa. Legumen 6–8 lin. longum, ad 2 lin. latum, minute pilosulum v. glabrum nec setosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

44. M. RUFIPILA, *Benth.! in Hook. Journ. Bot.* iv. 368. Fruticosa, patentim hirsutissima. Aculei rari. Pinnæ confertim 3–4-jugæ; foliola 20–30-juga, linearia, 3–4 lin. longa. Legumen margine dense setosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

45. M. NERVOSA, *Bong.; Benth.! in Hook. Journ. Bot.* iv. 370. Suffruticosa?, prostrata, patentim pilosa. Aculei parvi, decidui. Pinnæ dissite 2–3-jugæ v. 1-jugæ; foliola 6–12-juga, oblonga v. lanceolata, 3–4-linearia, subglauca, glabra v. subtus pilosa. Legumen ¾-pollicare, 2–2½ lin. latum, margine longe setosum, faciebus appresse pilosulis v. strigosis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

M. hirta, Vell. Fl. Flum. Ic. xi. t. 31, only known from the rude figure, may possibly be a variety of *M. nervosa* with rather larger and more numerous leaflets.

Series 6. Hirsutæ. *Suffrutices v. frutices pilis patentibus hirsuti, inermes. Pinnæ confertim v. dissite 2–4-jugæ, rarius 1-jugæ. Foliola multijuga, 3–5-nervia, immarginata. Pedunculi axillares petiolo communi longiores v. superiores in racemum terminalem dispositi. Capitula globosa v. oblonga. Flores 4-meri. Legumen setosum v. hispidum, valvis in articulos secedentibus.*

I have collected under this head a number of species which have the long peduncles of the last three species of *Pudicæ* and of the *Pedunculosæ*, but without the prickles of the former, and without the nerve-like margins of the leaflets of both those groups. The pinnæ are also rarely reduced to a single pair (in the last two species), whilst in the *Pedunculosæ* it is only the first two that have a second pair.

46. M. MACROCEPHALA, *Benth.! in Mart. Fl. Bras. Mim.* Erecta, dura, longe rufo-pilosa. Pinnæ confertim 2-jugæ; foliola 8–15-juga, ovato-oblonga, 4–6-linearia, utrinque pilis ciliatis ramosisve vestita. Capitula oblonga. Legumen pollicare, 3 lin. latum, margine densissime longeque setosum, valvis nudis articulatis.

Hab. Tropical America: Brazil, prov. Goyaz.

47. M. ECHINOCARPA, *Benth.! in Mart. Fl. Bras. Mim.* Erecta, patentim hispida. Pinnæ subconfertim 3-jugæ; foliola 15–20-juga, oblonga, 2–3-linearia, glabra v. parce ciliata. Capitula globosa. Legumen 8–10-lineare, 2–2½ lin. latum, margine dense longeque setosum, valvis nudis v. breviter setosis articulatis.

Hab. Tropical America: Brazil, prov. Goyaz.

48. M. VESTITA, *Benth.! in Hook. Journ. Bot.* iv. 369. Suffruticosa, patentim hirsutissima. Pinnæ subdissite 4-jugæ; foliola 8–12-juga, late oblonga, sub-3-linearia, utrinque laxe hirsuta v. fere glabra. Capitula globosa, longe racemosa. Legumen 3¼-polli-

care, ad 3 lin. latum, margine breviter setosum, valvis retrorsum setosis indivisis v. 2-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

49. M. HIRSUTA, *Spreng.! Syst.* ii. 204. Suffruticosa, decumbens, patentim pilosa. Pinnæ dissite 2–3-jugæ; foliola 6–12-juga, oblonga v. lanceolata, subtus pilosa, 2–3 lin. longa. Pedunculi axillares. Capitula ovoideo-globosa. Legumen ignotum.—*Fl. Bras. Mim.*

M. dispersa, Benth.! in Hook. Journ. Bot. iv. 369.

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes and Goyaz.

50. M. POGONOCLADA, *Benth.! in Mart. Fl. Bras. Mim.* Suffruticosa, procumbens, longe setoso-pilosa. Pinnæ dissite 3–5-jugæ; foliola 10–12-juga, oblonga, 2–3 lin. longa, coriacea, subtus parce setosa. Pedunculi axillares. Capitula globosa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Minas Geraes and Parana.

51. M. PROCURRENS, *Benth.! in Hook. Journ. Bot.* iv. 371. Suffruticosa, prostrata, longe rufo-pilosa. Pinnæ confertim 2-jugæ v. summæ 1-jugæ; foliola 10–15-juga, ovato-oblonga, subsemipollicaria, sparse pilosa. Capitula globosa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

52. M. BARBIGERA, *Benth.! in Hook. Journ. Bot.* iv. 371. Suffruticosa, longe patentim pilosa. Pinnæ 1-jugæ rarius 2-jugæ; foliola 12–18-juga, oblonga, 4–5-linearia, glabra v. subtus parce pilosa. Legumen subpollicare, 2 lin. latum, margine setosum, valvis demum denudatis articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

53. M. HIRSUTISSIMA, *Mart.! Herb. Fl. Bras.* 135. Suffruticosa, longe patentim pilosa. Pinnæ 1-jugæ, petiolo abbreviato; foliola 15–20-juga, oblonga, 4–5 lin. longa, utrinque pilosa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo.

Series 7. Pedunculosæ. *Suffrutices, rarius frutices* (*v. interdum herbæ*?), *reptantes prostrati v. diffusi, inermes. Pinnæ* 1*-jugæ v. rarius* 2–4*-jugæ. Foliola pluri- sæpius multijuga, margine nerviformi cincta. Pedunculi axillares, sæpius elongati. Capitula globosa. Flores* 4*-meri, rarius* 5*-meri. Legumen setosum v. hispidum, valvis articulatis.*

* *Pinnæ 2–4-jugæ.*

54. M. ELONGATA, *Benth.! in Hook. Journ. Bot.* iv. 369. Suffruticosa, patentim v. reflexo-pilosa. Pinnæ 3–4-jugæ; foliola 20–30-juga, lanceolata v. linearia, 3–4. lin. longa, subtus pilosa. Pedunculi pollicares. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil (prov. Goyaz?).

55. M. TOMENTOSA, *Humb. et Bonpl.! in Willd. Spec.* iv. 1033. Fruticosa, pilis patentibus villosa, ramis elongatis. Pinnæ 2-jugæ. Foliola 10–18-juga, oblonga, 3–4-linearia, utrinque dense appresseque setoso-villosa. Legumen $\frac{3}{4}$-pollicare, 2–2$\frac{1}{2}$ lin. latum, undique dense appresseque setoso-villosum, valvis articulatis.—*Kunth! Mim.* t. 4.

Hab. Tropical America: Columbia, Maypures on the Orinoco, *Humboldt and Bonpland*, *Spruce*, n. 3654; Barcelona, *Moritz.*

** *Pinnæ unijugæ.*

56. M. LONGIPES, *Benth.! in Hook. Journ. Bot.* iv. 370. Subacaulis, patentim pilosa. Petioli pedunculique subradicales, semipedales longioresque; foliola 8–20-juga, late linearia, ½–1-pollicaria, glabra v. inferiora subtus pilosa. Legumen 1–1½-pollicare, 3–4 lin. latum, margine parce ciliatum, faciebus pilis brevibus conspersis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

57. M. FLAGELLARIS, *Benth.! in Hook. Journ. Bot.* iv. 372. Prostrata, parce scabro-hispida. Petiolus brevis; foliola 5–7-juga, obovata v. oblonga, subsemipollicaria, 2–3-nervia, glabra v. pilis brevibus conspersa. Legumen semipollicare, margine setosum, faciebus glabris nudis.—*Fl. Bras. Mim.*

Hab. Extratropical South America: South Brazil, *Sello*; Porto Alegre, *Tweedie.*

58. M. MARGINATA, *Lindl.! Bot. Reg.* 1838, *Misc.* 82. Prostrata, patentim pilosa. Petiolus brevis; foliola 10–20-juga, oblonga, 4–5 lin. longa, subavenia, glabra v. subtus strigillosa. Legumen 8–10-lineare, undique setoso-hispidissimum.—*Fl. Bras. Mim.*

M. prostrata, Hort. Berol.! Schleid. in Nov. Act. Nat. Cur. xix. pars ii. 70 (nomen).

Hab. Extratropical South America: South Brazil, *Sello*; Maldonado, *King*; Rio de la Plata, *Anderson.*

59. M. FALCIPINNA, *Benth.! in Hook. Journ. Bot.* iv. 371. Prostrata, patentim pilosa. Foliola 20–30-juga, oblonga, 3–4 lin. longa, longe setosissima. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

60. M. DISTANS, *Benth.! in Hook. Journ. Bot.* iv. 382. Suffruticosa, strigoso-pilosa. Petiolus ½–1-pollicaris; foliola 20–50-juga, falcato-lanceolata, 3½–4½ lin. longa, subtus strigosa, costa submarginali. Legumen semipollicare, 2 lin. latum, undique breviter setosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes, and Goyaz.

The species approaches *M. neuroloma* in the almost marginal midrib, and is often near it in habit; but the peduncles are twice as long, and the indumentum different.

61. M. AXILLARIS, *Benth.! in Hook. Journ. Bot.* iv. 382. Fruticosa? decumbens v. prostrata, strigosa. Petiolus abbreviatus; foliola 20–40-juga, oblongo-linearia, 2 lin. longa, nitida, supra nigra, subtus canescentia, costa tenui a margine distante. Legumen semipollicare, 2 lin. latum, breviter strigosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes? and Goyaz.

62. M. REPTANS, *Benth.! in Hook. Journ. Bot.* iv. 372. Suffruticosa, reptans, pubescens parceque pilosa. Petiolus brevissimus; foliola 12–20-juga, oblongo-linearia, 1–2 lin. longa, conferta. Capitula globosa. Bracteæ corolla multo breviores. Legumen subsemipollicare, 2 lin. latum, margine aspero-hirtum, faciebus strigoso-setulosis.—*Fl. Bras. Mim.*

Hab. Extratropical South America: South Brazil, Maldonado, Asuncion.

63. M. LASIOCEPHALA, *Benth. ! in Hook. Journ. Bot.* iv. 372. Suffruticosa, procumbens, molliter piloso-pubescens. Petiolus brevissimus; foliola 10–15-juga, oblongo-linearia, 1–2 lin. longa, conferta. Capitula ovoidea, bractearum ciliis prominentibus villosissima. Legumen subsemipollicare, 2 lin. latum, margine aspero-hirtum, faciebus strigoso-setulosis.—*Fl. Bras. Mim.*

Hab. Extratropical (?) South America: South Brazil, *Sello.*

64. M. PAUPERA, *Benth.! in Hook. Journ. Bot.* iv. 272. Suffruticosa, prostrata, ramosissima, strigosa v. glabrata. Petiolus filiformis, $\frac{1}{2}$–$\frac{3}{4}$-pollicaris; foliola 4–8-juga, oblonga, 2–3 lin. longa, marginata, ciliata. Legumen semipollicare, $1\frac{1}{2}$ lin. latum, breviter strigosum.—*Fl. Bras. Mim.*

Hab. Extratropical South America: South Brazil, *Sello*; Banda Oriental.

65. M. MULTIPLEX, *Benth. ! in Hook. Journ. Bot.* iv. 373. Suffruticosa, diffusa, tenuis. subglabra. Petiolus filiformis; foliola 5–8-juga, oblonga, 2–3 lin. longa, obscure marginata, nuda. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Extratropical (?) South America; South Brazil, *Sello.*

66. M. DIFFUSA, *Benth.! in Hook. Journ. Bot.* iv. 373. Suffruticosa, diffusa, tenuissima, glaberrima. Petiolus filiformis; foliola 20–30-juga, linearia, 1–2 lin. longa, marginata, nuda. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Extratropical South America: South Brazil.

Series 8. Meticulosæ. *Frutices, suffrutices v. herbæ rigidæ, inermes. Pinnæ unijugæ. Foliola multijuga, rarius paucijuga, rigida, 2-plurinervia, margine nerviformi ciliato cincta. Pedunculi sæpius gemini, in racemum rarius in paniculam terminalem dispositi, v. inferiores axillares brevesque. Capitula globosa v. rarius elliptica. Flores vulgo 4-meri. Legumen ubi notum setosum, valvis indivisis v. pauciarticulatis.*

The numerous Brazilian species of this series, differing slightly from the *Castæ* in the total absence of prickles, and from the *Pedunculosæ* in inflorescence, from the *Hirsutæ* in the nerve-like margin of the leaflets, are exceedingly difficult to arrange in subordinate groups. After repeated trials the following have appeared to me the most natural.

A. *Legumen ubi notum breve v. oblongum, 1–2-spermum, valvis indivisis (marginibus interdum vix solutis); in speciebus 3 prioribus ignotum.*

* *Racemus ramosus (in posterioribus simplex). Petiolus communis subnullus. Foliola coriacea* (POLYCEPHALA).

67. M. TAXIFOLIA, *Bong.; Benth. ! in Hook. Journ. Bot.* iv. 373. Fruticosa, strigosa. Petiolus brevissimus; foliola 15–20-juga, oblongo-linearia, rigida, ad 3 lin. longa, ciliata, glabra. Capitula breviter pedunculata, paniculata. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

68. M. POLYCEPHALA, *Benth.! in Hook. Journ. Bot.* iv. 374. Fruticosa, molliter villosa. Petiolus brevissimus; foliola 30–40-juga, oblongo-linearia, ad 3 lin. longa,

utrinque villosa. Capitula breviter pedunculata, paniculata. Legumen junius densissime rufo-pilosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Pernambuco.

** *Folia ad basin caulis pauca, petiolo* 3–6-*pollicari.*

69. M. PETIOLARIS, *Benth.! in Hook. Journ. Bot.* iv. 376. Suffruticosa, strigoso-setulosa. Foliola 12–20-juga, oblonga, 4–5-linearia. Capitula breviter pedunculata, in caule subaphyllo longe racemosa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil (prov. Goyaz ?).

*** *Foliorum petiolus communis brevis, rarius* 1–3-*pollicaris. Foliola coriacea, insigniter marginata, glabra v. scabro-hispida* (RIGIDÆ).

† *Calyx paleaceus.*

70. M. HONESTA, *Mart.! Herb. Fl. Bras.* 137. Fruticosa, prostrata, longe pilosa. Foliola sub-4-juga, ovato-orbiculata, 4–5-linearia. Capitula ad apices ramorum pauca, breviter pedunculata. Legumen ignotum.—*Benth. in Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia.

71. M. RIGIDA, *Benth.! in Hook. Journ. Bot.* iv. 377. Suffruticosa, glabra v. parce setulosa. Foliola 10–12-juga, dimidiato-oblonga, subsesquipollicaria, glabra. Capitula racemosa, setosò-hispida. Legumen 4–6 lin. longum, 3 lin. latum, rigide setosissimum, valvis indivisis v. vix 2-articulatis.—*Fl. Bras. Mim.*

M. calocephala, var. ? *major,* Mart.! Herb. Fl. Bras. n. 1088.

Hab. Tropical America: Brazil, prov. Minas Geraes.

†† *Calyx obsoletus.*

72. M. CALLOSA, *Benth.! in Hook. Journ. Bot.* iv. 376. Suffruticosa, glabra, glauca. Petiolus 1–1½-pollicaris; foliola 30–50-juga, conferta, dimidiato-lanceolata, 2-linearia. Legumen semipollicare, longe denseque setosum, valvis indivisis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil (prov. Rio Janeiro or Bahia ?), *Lushnath.*

73. M. SETIPES, *Benth.! in Hook. Journ. Bot.* iv. 376. Suffruticosa, setosa. Petiolus vix semipollicaris; foliola 30–50-juga, conferta, lanceolata, 3–4-linearia, margine setosa, cæterum glabra. Legumen semipollicare, densissime setosum, valvis indivisis.—*Fl. Bras. Mim.*

Hab. Tropical America: South Brazil.

74. M. METICULOSA, *Mart.! Herb. Fl. Bras.* 135, *non Benth.* Suffruticosa, sparse setosa, glabra v. superne pubens. Foliola 10–12-juga, ovali-oblonga, 4–8 lin. longa, glabra v. subtus sparse strigosa. Legumen sæpius obovatum, 1-spermum, 3–4-lineare, densissime setosum, valvis indivisis.—*Fl. Bras. Mim.*

M. rigescens, Benth.! in Hook. Journ. Bot. iv. 376.

Hab. Tropical and extratropical South America: Brazil, prov. Minas Geraes, South Brazil, and Rio Grande.

75. M. CONFERTA, *Benth.! in Mart. Fl. Bras. Mim.* Suffruticosa, hispida. Petiolus

brevissimus; foliola 10–18-juga, oblonga, 3–4-linearia, utrinque strigoso-villosa. Legumen 3–3½ lin. longum, undique longe denseque setosum, valvis indivisis.

M. acerba, var. *latifolia*, Benth. in Hook. Journ. Bot. iv. 378.

Hab. Tropical America: Brazil, prov. Sao Paulo and Minas Geraes.

76. M. ACERBA, *Benth.! in Hook. Journ. Bot.* iv. 378, *excl. var.* β. Suffruticosa, scabro-hispida. Petiolus ¼–½-pollicaris; foliola 15–30-juga, oblonga, 3–5 lin. longa, utrinque scabro-hispida. Legumen obovatum, 3–4 lin. longum, densissime setosum, valvis subindivisis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

**** *Rami lanati v. molliter villosi. Petiolus brevissimus, rarius semipollicaris. Foliola glabra v. molliter villosa, margine nerviformi tenui. Calyx obsoletus* (ERIOCAULES).

77. M. ERIOPHYLLA, *Benth.! in Hook. Lond. Journ.* v. 87. Fruticosa, dense lanata. Foliola 10–15-juga, oblonga, 8–10 lin. longa, dense sericeo-villosa. Legumen junius setosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo.

78. M. POGOCEPHALA, *Benth.! in Hook. Journ. Bot.* iv. 382. Fruticosa, ramis dense lanatis. Foliola 12–15-juga, oblonga, 3–4 lin. longa, glabra v. subtus pilosula, plana, tenuiter 2–3-nervia. Capitula bractearum ciliis villosissima. Legumen 6–8 lin. longum, 3–4 lin. latum, breviter denseque muricato-setosum, valvis indivisis v. vix 2-articulatis. —*Fl. Bras. Mim.*

M. erinacea, Benth.! *l. c.* 383.

Hab. Tropical America: Brazil, prov. Minas Geraes.

79. M. ERIOCAULIS, *Benth.! in Hook. Journ. Bot.* iv. 383. Fruticosa, ramulis tomentoso-lanatis. Foliola 15–20-juga, oblonga, 4–6-linearia, glabra v. subtus strigillosa, plana, tenuiter 2–3-nervia. Bractearum cilia ultra alabastros haud prominentia. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

80. M. MICROCARPA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, appresse lanata v. scabro-hirta. Folia in axillis sæpe conferta; foliola confertim 20–30-juga, linearia, 1–1½ lin. longa, supra glabra, subtus strigillosa, convexa, prominenter 2–3-nervia. Legumen vix 4 lin. longum, 2 lin. latum, undique hirsutissimum, valvis sæpius indivisis.

M. fasciculata, Benth! in Hook. Journ. Bot. iv. 383.

Hab. Tropical or subtropical South America: South Brazil.

As the *Acacia fasciculata*, Benth., proves to be a true *Mimosa*, and has consequently preoccupied the specific name, I have been obliged to change that of the present species.

B. *Legumen ubi notum planum, setosum v. strigosum, valvis in articulos 2 v. plures secedentibus.*

* *Foliola* (½–2-*pollicaria*), *dimidiata, utrinque villosa, subtus* (*excepta* M. imbricata) *prominente 2–5-nervia* (RUDES).

† *Calyx obsoletus.*

81. M. RUDIS, *Benth.! in Hook. Journ. Bot.* iv. 377. Suffruticosa, scabro-hispida.

Foliola 3–7-juga, dimidiato-ovata, pleraque 2-pollicaria, 3-nervia, scabro-hispida. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America : Brazil, prov. Minas Geraes or Goyaz.

82. M. ASPERRIMA, *Benth. ! in Hook. Journ. Bot.* iv. 377. Suffruticosa, scabro-hispida. Foliola 7–10-juga, dimidiato-oblonga, vix pollicaria, 3-nervia, scabro-hispida. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America : Brazil (prov. Minas Geraes ?).

†† *Calyx paleaceus.*

83. M. RADULA, *Benth. ! in Hook. Journ. Bot.* iv. 377. Suffruticosa, scabro-hispida. Foliorum inferiorum petiolus 2–3-pollicaris; foliola 5–7-juga, dimidiato-ovata, 1–2-pollicaria, 3–5-nervia, scabro-hirta. Capitula sessilia. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America : Brazil, prov. Goyaz.

84. M. CALYCINA, *Benth. ! in Hook. Journ. Bot.* iv. 377. Fruticosa v. suffruticosa, scabro-hispida. Petiolus brevissimus; foliola 8-10-juga, dimidiato-ovata, vix pollicaria, 3–5-nervia, scabro-hispida, ciliis marginalibus tenuibus. Legumen 1–1½-pollicare, 2–2½ lin. latum, undique densissime setosum, valvis 2–6-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America : Brazil, prov. Minas Geraes.

85. M. DIMIDIATA, *Benth. ! in Hook. Journ. Bot.* iv. 378. Suffruticosa, scabro-tomentella et longe pilosa. Petiolus brevissimus; foliola 12–15-juga, ovato-lanceolata, dimidiata, ½–¾-pollicaria, nervis 4–5 valde prominentibus, utrinque scabro-hispida, margine rigide ciliata. Legumen ignotum.

Hab. Tropical America : Brazil, prov. Goyaz.

86. M. IMBRICATA, *Benth. ! in Hook. Journ. Bot.* iv. 378. Suffruticosa, molliter pilosissima. Petiolus brevissimus; foliola 10–15-juga, falcato-oblonga, semipollicaria, conferta, subtus pilosissima, nervis vix conspicuis. Legumen ignotum.

Hab. Tropical America : Brazil, prov. Goyaz.

** *Foliola angusta, falcata, conferta, multijuga, insigniter marginata, præter cilia marginalia glabra. Calyx paleaceus v. pappiformis* (MARGINATÆ).

87. M. CALOCEPHALA, *Mart. ! Herb. Fl. Bras.* 133. Fruticosa v. suffruticosa, ramis crassis lanatis. Petiolus brevissimus; foliola 25–40-juga, oblongo-lanceolata, vix 5 lin. longa. Capitula ¾–1 poll. diametro. Legumen 4–6 lin. longum, molliter pilosissimum, valvis 2-articulatis.—*Benth. in Fl. Bras. Mim.*

M. Pohlii, Benth. ! in Hook. Journ. Bot. iv. 375.

Hab. Tropical America : Brazil, prov. Minas Geraes and Bahia.

88. M. PAPPOSA, *Benth. ! in Hook. Journ. Bot.* iv. 375. Fruticosa ? strigosa. Petiolus brevissimus; foliola 20–40-juga, oblongo-linearia, 2–3 lin. longa. Capitula 4–5 lin. diametro. Legumen ¾-pollicare v. longius, 3 lin. latum, molliter setosum, valvis 2–3-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America : Brazil, prov. Goyaz.

89. M. CONCINNA, *Benth. ! in Mart. Fl. Bras. Mim.* Fruticosa, patentim hirsuta.

Petiolus brevissimus; foliola 10–30-juga, linearia, fere 2 lin. longa. Capitula parva? Legumen ½–1-pollicare, ad 3 lin. latum, strigoso-setosum, valvis 2–5-articulatis.

Hab. Tropical America: Brazil, prov. Goyaz.

90. M. HYPOGLAUCA, *Mart. Herb. Fl. Bras.* 133, *pro parte.* Fruticosa, subsetoso-pubescens. Petiolus 1–3 lin. longus; foliola 15–30-juga, lineari-oblonga, 2–3 lin. longa. Capitula vix 4 lin. diametro. Legumen 6–9 lin. longum, 3 lin. latum, strigosum, valvis 2–4-articulatis.—*Benth. in Mart. Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Bahia.

*** *Foliola tenuiter marginata, parva v. rarius semipollicaria, pilis setisve appressis plus minus vestita* (VULGARES).

† *Capitula bractearum ciliis ante anthesin villosa. Calyx* (*excepta* M. subvestita) *pappiformis v. paleaceus.*

91. M. SUBVESTITA, *Benth.! in Hook. Journ. Bot.* iv. 379. Fruticosa? ferrugineo-hirta. Petiolus 1–2-linearis; foliola 8–10-juga, obovato-oblonga, subsemipollicaria. Calyx subnullus. Legumen 8–9 lin. longum, undique ferrugineo-hispidum, valvis pauci-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

92. M. LANATA, *Benth.! in Hook. Journ. Bot.* iv. 379. Suffruticosa, dense lanata. Petiolus 1–3-linearis, foliola 15–20-juga, oblonga, 3–4 lin. longa. Calyx pappiformis. Legumen semipollicare, undique dense setosum, valvis 2–3-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical or subtropical South America: South Brazil.

93. M. STIPULARIS, *Bong.*; *Benth.! in Hook. Journ. Bot.* iv. 380. Fruticosa, longe pilosa. Petiolus brevissimus; foliola 20–30-juga, oblongo-linearia, 2–3 lin. longa. Stipulæ latiusculæ. Inflorescentia brevis. Legumen *M. subsericeæ.*—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

Described from a single specimen, and may possibly prove to be a variety of *M. subsericea.*

94. M. SUBSERICEA, *Benth.! in Hook. Journ. Bot.* iv. 380. Suffruticosa, sericeo-pilosa v. strigosa. Petiolus semipollice brevior; foliola 20–50-juga, linearia, 1½–3 lin. longa. Stipulæ angustæ. Inflorescentia elongata, alte foliata. Legumen 6–10 lin. longum, margine densissime setosum, valvis 3–4-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo and Minas Geraes.

95. M. GOYAZENSIS, *Benth.! in Hook. Journ. Bot.* iv. 380. Suffruticosa, patentim hispida. Petiolus 1–2 lin. longus; foliola 15–20-juga, oblonga, 3–5 lin. longa. Inflorescentia basi tantum foliata. Capitula 3–4 lin. diametro, alabastris villis obtectis. Legumen ignotum.—*Fl. Bras. Mim.*

96. M. TREMULA, *Benth.! in Hook. Journ. Bot.* iv. 380. Suffruticosa, patentim hirsuta. Petiolus sæpius brevissimus; foliola 20–40-juga, lineari-lanceolata, 1–3 lin. longa. Inflorescentia basi tantum foliata. Capitula 2–3 lin. diametro, alabastris semitectis. Legumen semipollicare, margine dense setosum, valvis 3–4-articulatis.— *Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo and Minas Geraes.

†† *Capitula alabastris eminentibus non villosa. Calyx obsoletus.*

97. M. SETISTIPULA, *Benth.! in Hook. Journ. Bot.* iv. 379. Fruticosa, ferrugineo-hirta. Petiolus brevissimus; foliola 10–15-juga, oblonga, 3–4 lin. longa, obscure 2–3-nervia. Legumen vix semipollicare, margine dense ferrugineo-setosum, valvis 2–3-articulatis.—*Fl. Bras. Mim.*

M. meticulosa, var. *fuscescens,* Benth.! *l. c.* 382.

Hab. Tropical America: Brazil, prov. Minas Geraes.

98. M. NEUROLOMA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, hispida. Petiolus infra-semipollicaris; foliola 15–40-juga, lanceolato-subfalcata, 3–4 lin. longa, costa prominula submarginali. Legumen $\frac{1}{2}$–$\frac{3}{4}$-pollicare, undique setosum, valvis 2–3-articulatis.

M. meticulosa, Benth.! in Hook. Journ. Bot. iv. 381, non Mart.

Hab. Tropical America: Brazil, prov. Sao Paulo and Minas Geraes.

99. M. BREVIPES, *Benth.! in Hook. Journ. Bot.* iv. 381. Suffruticosa, piloso-hirta, caule virgato dense foliato. Petiolus subnullus; foliola 15–20-juga, ad 3 lin. longa, conferta, 2–3-nervia. Legumen vix 4 lin. longum, hirsutissimum, valvis 2-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

100. M. HUMIFUSA, *Benth.! in Mart. Fl. Bras. Mim.* Suffruticosa, ramosissima, prostrata. Petiolus 1–2 lin. longus, pinnæ 4–5 lin.; foliola 8–10-juga, conferta, 1–2 lin. longa, 1-nervia. Legumen junius dense setosum.

Hab. Tropical America: Brazil, prov. Minas Geraes.

Series 9. Myriophyllæ. *Frutices suffruticesve inermes. Pinnæ multijugæ. Foliola multijuga, parva. Capitula globosa v. ovoidea, in racemum terminalem disposita v. inferiora axillaria. Flores vulgo* 4*-meri. Legumen ubi notum breve, setosum, valvis indivisis.*

101. M. REGNELLII, *Benth.! in Linnæa,* xxii. 529. Suffruticosa, elata, strigoso-villosa. Pinnæ 8–10-jugæ; foliola 25–35-juga, oblonga, 2–3 lin. longa, ciliata v. dorso strigosa. Capitula globosa, breviter pedunculata, longe racemosa. Calyx pappiformis. Legumen ovatum, turgidum, 3–4-lineare, dense strigoso-setosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

102. M. MYRIOPHYLLA, *Bong.; Benth.! in Hook. Journ. Bot.* iv. 384. Suffruticosa, strigosa. Pinnæ 12–30-jugæ; foliola 30–60-juga, oblongo-linearia, 1–1$\frac{1}{2}$ lin. longa, glabra v. canescentia. Capitula ovoidea, brevissime pedunculata, longe racemosa. Calyx paleaceus. Legumen ovatum, 2–3-lineare, strigoso-setosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes?

103. M. MICROPTERIS, *Benth.! in Hook. Journ. Bot.* iv. 384. Fruticosa, strigoso-scabra. Pinnæ 10–15-jugæ; foliola 15–20-juga, obtusa, vix lineam longa, nitidula. Capitula globosa, longiuscule pedunculata, axillaria v. breviter racemosa. Calyx pappiformis. Legumen junius strigosum.—*Fl. Bras. Mim.*

Hab. Extratropical South America: South Brazil.

Series 10. Spicifloræ. *Frutices ramis sæpius laxe sarmentosis v. alte scandentibus, aculeis sparsis sæpius parvis crebris recurvis. Pinnæ pluri- v. multijugæ. Foliola multijuga. Flores plerique v. omnes 5-meri, 5-andri, in spicas cylindraceas v. oblongas rarius ovoideas axillares v. paniculatas dispositi. Legumen planum, elongatum, nudum v. margine aculeolatum, valvis tenuibus multiarticulatis.*

A very distinct series, with the pod and habit of some *Habbasiæ*, but differing in their 5-merous flowers with only 5 stamens.

* *Foliorum petiolus communis eglandulosus. Spicæ axillares v. ad apices ramorum racemosæ.*

104. M. TOVARENSIS, *Benth.*, sp. n. Rami laxe pubescentes. Pinnæ 4–5-jugæ; foliola 10–20-juga, linearia, 1–2 lin. longa. Spicæ ovoideæ, rhachi ad 3 lin. longa. Legumen 3–4 poll. longum, 6–7 lin. latum, puberulum, margine minute aculeato v. nudo.

Hab. Tropical America: Venezuela, near the colony of Tovar (Caracas), *Fendler*, n. 344.

Habitu et aculeis *M. spicifloræ* valde affinis, pube diversa. Pinnæ et foliola multo pauciora, petiolo communi vix pollicem longo; pinnis $\frac{1}{2}$–$\frac{3}{4}$-pollicaribus. Spicæ fere ad capitulum reductæ, floribus iis *M. spicifloræ* minoribus, pariter tamen 5-meris 5-andrisque. Legumen angustius quam in *M. spiciflora*, cæterum simillimum.

105. M. SPICIFLORA, *Karst.! Fl. Colomb.* ii. 61, t. 131. Glabra v. pube tenui in ramis rara, in spicæ rhachi brevi. Pinnæ 7–10-jugæ; foliola 20–40-juga, linearia, 2–3 lin. longa. Spicæ cylindraceæ, densæ, pollicares. Legumen 4–5-pollicare, $\frac{1}{2}$–$\frac{3}{4}$ poll. latum, minute puberulum, margine aculeolato v. nudo, valvis tenuibus multiarticulatis.

Schrankia glabra, Benth.! in Hook. Lond. Journ, v. 94.

Hab. Tropical America: Colombia, *Linden*, n. 1501; Caracas and Porto Cabello, *Karsten*, *Fendler*, n. 2245.

106. M. RHODOSTACHYA, *Benth.! in Mart. Fl. Bras. Mim.* Tomentoso-pubescens. Pinnæ 5–8-jugæ; foliola 20–25-juga, linearia, $1\frac{1}{2}$–2 lin. longa. Spicæ laxiusculæ, $1\frac{1}{2}$–2-pollicares. Legumen 3–4 poll. longum, 5–6 lin. latum, glabrum, nudum, valvis tenuibus multiarticulatis.—*Fl. Bras. Mim.*

Schrankia rhodostachya, Benth.! in Hook. Journ. Bot. iv. 414.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Minas Geraes, Bahia, and Ceara.

107. M. MILLEFOLIATA, *Scheele in Linnæa*, xvii. 337, *ex char. dato.* Pubescens. Pinnæ 10–20-jugæ; foliola 30–40-juga, anguste linearia, 1–$1\frac{1}{2}$ lin. longa. Spicæ laxiusculæ, 2–3-pollicares. Legumen sub-4-pollicare, 6–8 lin. latum, glabrum, nudum v. aculeis marginalibus raris, valvis tenuibus multiarticulatis.—*Fl. Bras. Mim.*

Schrankia macrostachya, Benth.! in Hook. Journ. Bot. iv. 414.

Mimosa calistachya, Presl, Bot. Bemerk. 65, ex char. dato.

Hab. Tropical America: Brazil, prov. Minas Geraes, and probably Sao Paulo.

** *Foliorum petiolus glandula scutelliformi instructus. Frutices alte scandentes. Spicæ ad apices ramorum ample paniculatæ.*

The petiolar gland is wanting in the whole genus except in the following two species and in the small

series *Glanduliferæ* of *Habbasia*, which also resemble the following in their habit and prickles, but have globular flower-heads and diplomerous stamens.

108. M. MYRIADENA, *Benth.! in Mart. Fl. Bras. Mim.* Tomentella v. puberula. Pinnæ 8–12-jugæ; foliola 20–30-juga, oblique oblonga, obtusa, 1½–4 lin. longa, subtus glanduloso-punctata (v. rarius epunctata?). Legumen ad 3 poll. longum, 4–5 lin. latum, glanduloso-punctatum, nudum, valvis multiarticulatis.

Entada myriadena, Benth.! in Hook. Journ. Bot. ii. 133.

Acacia paniculæflora, Steud.! in Flora, 1843, 760.

Hab. Tropical America: North Brazil, Guiana, Venezuela; also apparently in New Granada, at Villavicenzia near Bogota, *Triana*; the specimen in fruit only, and the leaflets more pubescent underneath, with the glandular dots scarcely perceptible, but with the large petiolar gland characteristic of the species.

109. M. PUNCTULATA, *Spruce*: *Benth.! in Mart. Fl. Bras. Mim.* Puberula mox glabrescens. Pinnæ 3–6-jugæ; foliola 6-10-juga, oblique obovata v. rhombea, 6–9 lin. longa, glabra, subtus punctis glandulosis conspersa. Legumen ignotum.

Hab. Tropical America: North Brazil.

Series 11. Obstrigosæ. *Fruticuli inermes v. sparse aculeati, strigis rigidis in ramis pedunculisque deorsum appressis, v. rarius glabri. Pinnæ unijugæ. Foliola parva, multijuga. Capitula globosa, in axillis breviter pedunculata v. sessilia, rarius ad apices ramorum breviter racemosa. Flores sæpissime 5-meri. Legumen planum v. crassum, valvis pauciarticulatis v. indivisis.*

* *Foliorum petiolus communis 1½–4 lin. longus.*

110. M. GLABRA, *Benth.! in Hook. Journ. Bot.* iv. 386. Glaberrima glauca. Aculei recti. Foliola 6–10-juga, oblongo-linearia, coriacea, 1½–2½ lin. longa. Pedunculi ½–1-pollicares. Legumen ½–1 poll. longum, fere 3 lin. latum, crassum, nudum, marginibus latis, valvis indivisis.—*Fl. Bras. Mim.*

Hab. Extratropical South America: South Brazil.

111. M. SPARSA, *Benth.! in Hook. Journ. Bot.* iv. 385. Parce deorsum strigosa. Aculei tenues, recti. Foliola 10–18-juga, oblongo-linearia, 1–1½ lin. longa, subglabra. Pedunculi ½–1-pollicares. Legumen 1–1½-pollicare, planum, margine nerviformi appresse ciliato, valvis glabris nudis 6–8-articulatis.—*Fl. Bras. Mim.*

Hab. Extratropical South America: South Brazil.

** *Foliorum petiolus communis brevissimus subnullus.*

112. M. PARVIPINNA, *Benth.! in Hook. Journ. Bot.* iv. 384. Deorsum strigosa, inermis. Pinnæ 3–6 lin. longæ; foliola 15–30-juga, linearia, semilineam longa, glabra, ciliolata. Pedunculi 2–2½ lin. longi. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Extratropical South America: South Brazil.

113. M. RUPESTRIS, *Benth.! in Hook. Journ. Bot.* iv. 385. Deorsum strigosa, subinermis. Pinnæ ¾–1-pollicares; foliola 20–30-juga, oblongo-linearia, 1–1½ lin. longa, glabra, ciliolata. Pedunculi subpollicares. Legumen 4–9 lin. longum, 2 lin. latum, rigide strigoso-setosum.—*Fl. Bras. Mim.*

M. subinermis, Benth! *l. c.*

Hab. Tropical and subtropical South America: Brazil, prov. Minas Geraes and the southern provinces.

114. M. RAMULOSA, *Benth.! in Hook. Journ. Bot.* iv. 385. Deorsum strigosa. Aculei sparsi. Foliola 10–15-juga, oblonga, linea sæpius breviora, glabra, ciliolata. Pedunculi 2–6 lin. longi. Legumen junius undique strigoso-setosum.—*Fl. Bras. Mim.*

Hab. Extratropical South America: Brazil, southern provinces and adjoining parts of the Argentine Republic.

115. M. CILIATA, *Spreng.! Syst.* ii. 205. Deorsum strigosa. Aculei sparsi. Foliola 6–8-juga, oblonga, $1\frac{1}{2}$ lin. longa, glabra, nitentia. Capitula sessilia. Legumen 9–12 lin. longum, undique strigoso-setosum, margine latiusculo, valvis pluriarticulatis.—*Fl. Bras. Mim.*

M. Sprengelii, DC.! Prod. ii. 430; Benth.! in Hook. Journ. Bot. iv. 385.

Hab. Extratropical South America: South Brazil.

In some herbaria I have seen specimens both of *M. sparsa* and of *M. appressa* distributed with the *M. ciliata* under the name of *M. Sprengelii*. I had adopted the latter name for the present species given to it by De Candolle on account of the older *M. ciliata* of Willdenow; but as the latter proves not to be different from the *M. asperata*, Linn., Sprengel's *M. ciliata* must now be restored.

116. M. ADPRESSA, *Hook. et Arn.! in Hook. Bot. Misc.* iii. 202. Deorsum strigosa. Aculei sparsi. Foliola 20–30-juga, linearia, 1–3 lin. longa, glabra. Capitula sessilia. Legumen pollicare v. paullo longius, $2\frac{1}{2}$–3 lin. latum, planum, strigosum, margine nerviformi, valvis 3–5-articulatis.—*Fl. Bras. Mim.*

Hab. Extratropical South America: Banda Oriental and adjoining districts of the Argentine Republic.

Series 12. Lepidotæ. *Frutices inermes, plus minus tomento stellato plumoso v. lepidoto incani flavicantes v. fulvescentes. Pinnæ uni- v. plurijugæ. Foliola pluri- v. multijuga. Capitula globosa v. spicæ oblongæ v. cylindraceæ, in axillis superioribus pedunculata, v. summa interdum paniculata. Flores sæpissime 4-meri, in pluribus speciebus flavi. Legumen planum, tomentosum v. lanatum, nec setosum, monospermum v. valvis pluriarticulatis.*

The peculiar tomentum of this series is not to be met with in any other part of the genus except in a few species of the *Habbasiæ Leptostachyæ*.

* *Pinnæ unijugæ. Capitula depressa vel globosa.*

117. M. INVOLUCRATA, *Benth.! in Hook. Journ. Bot.* iv. 386. Floccoso-tomentosa et plumoso-pilosa. Foliola 12–15-juga, linearia, $2\frac{1}{2}$–3 lin. longa, incana. Capitula depresso-globosa, bracteis lanceolatis pluriseriatis involucrata. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Extratropical? South America: South Brazil.

118. M. INCANA, *Benth.! in Hook. Journ. Bot.* iv. 387. Tomento lepidoto incana. Foliola 8–30-juga, oblonga, 1–3 lin. longa, obtusa, incana. Capitula parva, globosa, exinvolucrata. Legumen planum, incanum, 3–8 lin. longum, 2 lin. latum, valvis 1- ad pluriarticulatis.—*Fl. Bras. Mim.*

Acacia incana, Spreng.! Syst. iii. 137.

Acacia Sprengelii, Hook. et Arn. ! in Hook. Bot. Misc. iii. 205.
Mimosa pilulifera, Benth. ! in Hook. Journ. Bot. iv. 386.

Hab. Tropical and subtropical South America: Brazil, prov. Minas Geraes and the southern provinces, and on the Uruguay.

119. M. CHRYSASTRA, *Mart.; Benth. ! in Mart. Fl. Bras. Mim.* Lepidoto-tomentosa mox glabrata. Foliola 12–20-juga, oblonga, 1–2 lin. longa, obtusa, glabrata. Capitula parva, globosa, exinvolucrata. Legumen subpollicare, acuminatum, 2 lin. latum, lepidoto-tomentosum, planum, valvis sub-3-articulatis.

Hab. Tropical America: Brazil, prov. Minas Geraes.

** *Pinnæ plurijugæ. Capitula globosa.*

120. M. BONPLANDI, *Benth. ! in Hook. Journ. Bot.* iv. 387. Tomento lepidoto conspersa. Pinnæ 3–4-jugæ; foliola 8–15-juga, oblonga, vix 2 lin. longa, vix canescentia. Legumen $\frac{1}{2}$–1-pollicare, 2 lin. latum, furfuraceum v. stellato-tomentosum, valvis ad semina turgidis pluriarticulatis.—*Fl. Bras. Mim.*

Acacia Bonplandi, Gill. ! in Hook. Bot. Misc. iii. 205 et Ten. ! Cat. Ort. Napol. 77.
Acacia lepidota, Hook. et Arn. ! in Hook. Bot. Misc. iii. 205.

Hab. Extratropical South America: South Brazil and Argentine Republic.

This species appears to have been published independently in England and Naples under the same name of *M. Bonplandi,* given to it probably by some one, now unknown, who originally had the plant from Bonpland, and communicated it both to Gillies and to Tenore.

121. M. SCABRELLA, *Benth. ! in Hook. Journ. Bot.* iv. 387. Tomento lepidoto incana. Pinnæ 5–7-jugæ; foliola ultra 30-juga, oblongo-linearia, 1–3 lin. longa, utrinque incana. Legumen $1\frac{1}{2}$-pollicare, $2\frac{1}{2}$ lin. latum, planum, verrucoso-tomentosum, valvis 4–5-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical and subtropical South America: South Brazil and apparently prov. Goyaz.

122. M. CALOTHAMNUS, *Mart. ! Herb. Fl. Bras.* n. 1089. Leproso- v. floccoso-tomentosa. Pinnæ 2–3- rarius 1- v. 4-jugæ; foliola 12–16-juga, ovato-oblonga v. subrhombea, 3-linearia, coriacea, supra glabra nitida, subtus albo-tomentosa. Legumen planum, $\frac{1}{2}$–$1\frac{1}{2}$-pollicare, leproso-tomentosum, valvis pauciarticulatis.—*Benth. ! in Hook. Journ. Bot.* iv. 388; *Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

123. M. ERIOCARPA, *Benth. ! in Hook. Journ. Bot.* iv. 387. Plumoso- et lepidoto-tomentosa. Pinnæ 3–4-jugæ; foliola 8–15-juga, oblonga, 1–$1\frac{1}{2}$ lin. longa, utrinque lepidota. Legumen oblongum, 3–4 lin. longum, 1-spermum, densissime plumoso-lanatum.—*Fl. Bras. Mim.*

Hab. Tropical or subtropical South America: South Brazil.

124. M. AURIVILLUS, *Mart. ! Herb. Fl. Bras.* 132. Plumoso- et floccoso-tomentosa. Pinnæ 2-jugæ; foliola 4–8-juga, ovata v. oblonga, 2–5 lin. longa, crassa, utrinque dense stellato-tomentosa. Legumen subpollicare, 2 lin. latum, dense floccoso- v. plumoso-lanatum, 2-articulatum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

125. M. PEDUNCULARIS, *Bong.*; *Benth.! in Hook. Journ. Bot.* iv. 388. Rami longe setosi, inter setas glabri. Pinnæ 2–4-jugæ; foliola 6–8-juga, ovata v. oblonga, 2–3 lin. longa, utrinque lepidoto-tomentosa. Legumen subsemipollicare, vix 2 lin. latum, rufo-tomentosum et plumoso-setosum, pauciarticulatum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

*** *Pinnæ 2–4-jugæ. Spicæ oblongæ, semipollicares v. paullo longiores brevioresve.*

126. M. CALODENDRON, *Mart.! Herb. Fl. Bras.* n. 1087. Leproso- v. floccoso-tomentosa. Foliola 8–12-juga, ovata v. late oblonga, 3–5 lin. longa, supra glabra sæpiusque nitida, subtus albo-tomentosa. Spicæ oblongæ, 6–7 lin. longæ. Legumen $\frac{3}{4}$–1-pollicare, fere 3 lin. latum, densissime pulvinato-lanatum, valvis pauciarticulatis.—*Benth.! in Hook. Journ. Bot.* iv. 389; *Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

127. M. FURFURACEA, *Benth.! in Hook. Journ. Bot.* iv. 389. Furfuraceo-tomentosa. Foliola 10–15-juga, ovata, 2–4 lin. longa, utrinque dense tomentosa. Spicæ oblongo-cylindraceæ, 6–9 lin. longæ. Legumen 4–6 lin. longum, 3 lin. latum, densissime plumoso-velutinum, 1–2-spermum, valvis indivisis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Sao Paulo.

128. M. SORDIDA, *Benth.! in Hook. Journ. Bot.* iv. 389. Breviter plumoso- v. lepidoto-tomentosa. Foliola 10–15-juga, ovata v. oblonga, 3–4 lin. longa, utrinque stellato-tomentosa. Spicæ oblongæ, 4–6 lin. longæ. Legumen $\frac{3}{4}$–1 poll. longum, vix 2 lin. latum, planum, brevissime lepidoto- v. stellato-tomentosum, valvis 2–3-articulatis.—*Fl. Bras. Mim.*

Hab, Tropical America: Brazil, prov. Minas Geraes.

**** *Spicæ cylindraceæ, angustæ v. elongatæ.*

129. M. DALEOIDES, *Benth.! in Hook. Journ. Bot.* iv. 389. Breviter plumoso- v. stellato-tomentosa. Pinnæ unijugæ; foliola 10–15-juga, oblonga, 2–3 lin. longa, utrinque cano-tomentosa. Spicæ graciles, ad 7 lin. longæ, densæ v. basi interruptæ. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical or subtropical South America: Brazil, prov. Sao Paulo, and perhaps other southern provinces.

130. M. CYLINDRACEA, *Benth.! in Hook. Journ. Bot.* iv. 389. Tomento leproso v. plumoso canescens v. rufescens. Pinnæ 4–9-jugæ; foliola 15–20-juga, oblonga, vix 2 lin. longa, utrinque leprosa. Spicæ 1–1$\frac{1}{2}$-pollicares, superiores in racemo numerosæ. Legumen semipollicare, 2 lin. latum, crassiusculum, scabro-tomentosum, valvis pauciarticulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Bahia.

Sectio 2. HABBASIA.

Stamina numero petalorum duplo plura. Frutices v. rarius suffrutices v. herbæ, rarissime arborescentes, interdum alte scandentes. Foliorum petiolus in una serie glandulifer, in cæteris eglandulosus. Pinnæ pluri- v. multijugæ, in speciebus paucis unijugæ.

Spicæ globosæ oblongæ v. cylindraceæ. Calyx varius, sæpe magis evolutus quam in *Eumimosa*. Corolla sæpe profunde divisa, sæpius 4-mera, interdum 3-mera v. 5–6-mera. Leguminis margo sæpius nudus v. simplici serie aculeolatus, in seriebus ultimis interdum pariter ac valvæ setosus.

Series 1. Leptostachyæ. *Spicæ cylindraceæ* v. *elongatæ rarius breviter oblongæ. Indumentum tomentosum v. pubescens nec setosum. Petiolus eglandulosus. Flores in speciebus Mexicanis et Columbianis sæpius* 5-*meri*, 10-*andri, in Brasilianis* 4-*meri*, 8-*andri, sed fere in omnibus variant* 4–5-*meri.*

* *Inermes, lepidoto- v. stellato-tomentosæ.*

131. M. VERRUCOSA, *Benth.! in Hook. Journ. Bot.* iv. 390. Fruticosa, tomento lepidoto subverrucosa. Pinnæ 7–9-jugæ; foliola 10–20-juga, ovata v. oblonga, 2–3 lin. longa, crassiuscula, subtus 2-nervia, costa excentrica. Spicæ laxæ, 4-pollicares, ad apices ramorum racemosæ. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil prov. Piauhy and Bahia.

132. M. SCHOMBURGKII, *Benth.! in Hook. Journ. Bot.* ii. 133, iv. 390. Arborea, leproso-tomentella. Pinnæ 7–15-jugæ; foliola 15–20-juga, oblonga, 2–3 lin. longa, quam in *M. verrucosa* tenuiora, costa unica subcentrali excepta glabra. Spicæ laxæ, sub 3-pollicares, ad apices ramorum racemosæ. Legumen planum, breviter stipitatum, 2–3-pollicare, 4–5 lin. latum, leproso-tomentosum, inerme, valvis 6–8-articulatis.

Hab. Tropical America: British Guiana, *Schomburgk, Appun.*

133. M. TRIANÆ, *Benth.*, sp. n. Fruticosa ?, lepidoto-tomentosa. Pinnæ 10–20-jugæ; foliola 20–40-juga, subfalcato-oblonga, 2–3 lin. longa, supra convexa glabra nitida, subtus cano-tomentosa, costa centrali. Spicæ 2–3-pollicares, racemosæ. Legumen planum, breviter stipitatum, 1–2-pollicare, 3–4 lin. latum, brevissime lepidoto-tomentosum, inerme, valvis 4–8-articulatis.

Hab. Tropical America: New Granada, Villavicencio, *Triana.*

Frutex videtur *M. pteridifoliæ* affinis. Rami, petioli, axis inflorescentiæ et foliolorum costa in pagina inferiore tomento lepidoto v. substellato conspersi. Stipulæ parvæ, caducæ. Foliorum petiolus communis 3–6-pollicaris, eglandulosus. Pinnæ 1½–3-pollicares. Stipellæ minutæ, setaceæ. Foliola majora 3 lin. longa, apicem versus pinnæ decrescentia et in foliis ramulorum floridorum vix 2 lin. longa, obtusa v. acutiuscula, basi oblique truncata et fere auriculata, coriacea, supra convexa nitentia et siccitate nigricantia et forte in vivo viscidula, subtus tomento brevissimo substellato canescentia, costa lepidota prominente. Flores non vidi. Spicæ fructiferæ in racemum terminalem confertæ, secus rhachin 2–3næ, fere a basi cicatricibus florum notatæ. Leguminis margo tenuis, valvarum articuli subquadrati.

134. M. PTERIDIFOLIA, *Benth.! in Hook. Journ. Bot.* iv. 391. Fruticosa, glanduloso-sublepidoto-tomentosa. Pinnæ 12–18-jugæ; foliola 12–25-juga, oblonga, 1–2 lin. longa, supra minute puberula, subtus crebre glanduloso-punctata, costa subcentrali. Spicæ 1½–3-pollicares, ad apices ramorum racemosæ. Legumen immaturum 1½-pollicare, aureo-villosissimum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz and Bahia.

** *Inermes, molliter pubescentes v. tomentosæ, nunc canescentes v. glabræ.*

† *Pinnæ* 4- *v. plurijugæ. Foliola multijuga, semipollice breviora.*

135. M. HEBECARPA, *Benth.! in Hook. Lond. Journ.* v. 87. Arborea, molliter pubescens. Pinnæ 20–25-jugæ; foliola multijuga, oblonga, vix lineam longa. Spicæ axillares, 2–4-pollicares. Legumen planum, 1½–2-pollicare, 3 lin. latum, tomentoso-villosum, margine tenui, valvis 6–9-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

136. M. WARMINGII, *Benth.! in Mart. Fl. Bras. Mim.* Arborea, molliter pubescens. Pinnæ 4–5-jugæ; foliola 20–30-juga, falcato-linearia, acuta, 3–4 lin. longa, glabra. Spicæ axillares, 3–4-pollicares. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Minas Geraes.

137. M. PUBERULA, *Benth.! in Hook. Lond. Journ.* v. 88. Arborea, puberula. Pinnæ 5–10-jugæ; foliola 15–40-juga, oblonga, rigidula, obtusa, 2–2½ lin. longa. Spicæ axillares, 1½–2-pollicares. Legumen stipitatum, planum, 1½-pollicare, 3–4 lin. latum, pubescens, valvis 3–5-articulatis.

Hab. Tropical America: Mexico, near Zimapan, *Coulter*; "New Spain," *Herb. Pavon.*

Arbor, ramulis rigidis verruculosis, specimina tam Pavoniana quam Coulteriana omnino inermia, cæterum quoad folia *M. acutistipulæ* simillima. Stipulæ subulatæ, 2–3 lin. longæ, rigidulæ, caducæ. Foliorum petiolus communis 3–5-pollicaris, uti ramuli novelli pedunculique pube brevi molli vestitus. Pinnæ 1½–2-pollicares. Foliola crebra, crassiuscula, 2–2½ lin. longa, basi valde inæqualia et oblique truncata, costa tamen parum excentrica, utrinque puberula. Spicæ subgeminæ, breviter pedunculatæ. Flores membranacei, 4–5-meri, fere glabri. Corolla lineam longa, late infundibularis. Calyx subtriplo brevior. Legumen tenue, sæpius acuminatum.

138. M. DISCOLOR, *Benth.! in Hook. Journ. Bot.* iv. 391. Fruticosa, tomento minutissimo canescens v. glabrata. Pinnæ 4–6-jugæ. Foliola 15–25-juga, oblongo-linearia, 4–5 lin. longa, supra pallida, subtus ferruginea. Spicæ 1–2-pollicares, ad apices ramorum racemosæ. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

†† *Pinnæ* 2–4-*jugæ. Foliola paucijuga, semipollice longiora.*

139. M. SERICANTHA, *Benth.! in Hook. Journ. Bot.* iv. 392. Arborea, cano-puberula, subglauca. Pinnæ sub-3-jugæ; foliola 4–8-juga, obovata, ½–1-pollicaria, plurinervia. Spicæ graciles, 2–3-pollicares, racemosæ. Flores cano-sericei. Legumen stipitatum, planum, 2–3-pollicare, 3–4 lin. latum, cano-puberulum, valvis 4–8-articulatis.—*Fl. Bras. Mim.*

Pithecolobium cinereum, Mart. Herb.

Hab. Tropical America: Brazil, prov. Pernambuco.

140. M. PITHECOLOBIOIDES, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa v. arborea, minute tomentella. Pinnæ 2–4-jugæ. Foliola 2–5-juga, obovata, ½–1-pollicaria, penni-venia, glabra, supra nitida. Spicæ pollicares, densæ, racemosæ. Flores pubescentes. Legumen ignotum.

Pithecolobium lasiogynum, Mart. Herb.

Hab. Tropical America: Brazil, prov. Minas Geraes.

141. M. LASIOPHYLLA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, tomentosa. Pinnæ 3–4-jugæ; foliola 4–8-juga, ovata, ½–1-pollicaria, pennivenia, supra minute subtus molliter tomentoso-pubescentia. Spicæ pollicares, densæ, racemosæ. Legumen sessile, planum, 2–3-pollicare, 5–6 lin. latum, tomentosum, valvis 4–8-articulatis.

Hab. Tropical America: Brazil, prov. Minas Geraes.

(See also the unarmed states of *M. acutistipula* and *M. arenosa*.)

*** *Aculeatæ, molliter tomentoso-villosæ.*

142. M. FASCICULATA, *Benth. in Hook. Lond. Journ.* v. 88. Fruticosa, ferrugineo-tomentosa. Aculei sparsi, recurvi. Pinnæ 15–25-jugæ; foliola 10–25-juga, oblonga, ad 3 lin. longa, valde obliqua, costa submarginali, supra pubescentia, subtus villosa. Spicæ axillares v. racemosæ, 2–3-pollicares, densifloræ. Flores sericeo-villosi. Legumen ignotum.

Acacia fasciculata, Kunth! Mim. 75, t. 23.

Mimosa cinerea, Herb. Pavon.!

Hab. Tropical America: Mexico, *Humboldt and Bonpland, Karwinski.*

143. M. DYSOCARPA, *Benth.! in A. Gray, Pl. Wright.* i. 62. Fruticosa, ferrugineo-villosa. Aculei sparsi, subrecurvi. Pinnæ 6–10-jugæ; foliola 8–10-juga, oblonga, 1½–2 lin. longa., utrinque sericeo-villosa, costa submarginali. Spicæ axillares, oblongo-cylindraceæ, 1–1½-pollicares. Flores villosi. Stamina semipollicaria. Legumen planum, 1½–2-pollicare, ad semina 2–3 lin. latum, dense tomentoso-villosum, marginibus crassiusculis, valvis tardius in articulos longiusculos secedentibus.

Hab. Extratropical North America: West Texas and Mexican boundary, *Wright*, n. 144, 163, 1040, *Emory, Expedition*, n. 309.

144. M. GUATEMALENSIS, *Benth. Bot. Sulph.* 89, and in *Hook. Lond. Journ.* v. 89. Molliter villosa. Aculei sparsi, recti v. vix recurvi. Pinnæ 3–4-jugæ; foliola 3–6-juga, obovali-oblonga v. suborbiculata, ½–¾-pollicaria, supra breviter subtus longe villosa. Spicæ axillares, densæ, 1–1½-pollicares. Flores villosi. Legumen ignotum.

Acacia guatemalensis, Hook. et Arn.! Bot. Beech. 419.

Hab. Tropical America: Mexico and Central America, *Barclay, Sinclair, Coulter*, also in *Herb. Pavon.* under the name of *M. ferruginea,* and a broad-leaved form under that of *M. rotundifolia.*

145. M. CADUCA, *Poir. Dict. Suppl.* i. 83. Molliter villosa v. tomentosa. Aculei sparsi, subrecurvi. Pinnæ 4–6-jugæ; foliola 8–10-juga, obovato-oblonga, 3–4 lin. longa, supra convexa nitidula vix puberula, subtus ferrugineo-pubescentia. Spicæ axillares, pedunculatæ, oblongæ, ½–¾-pollicares. Flores pubescentes. Legumen planum, ferrugineo-tomentosum, subsesquipollicare, 3–4 lin. latum, marginibus aculeatis, valvis articulatis.

Acacia caduca, Humb. et Bonpl. in Willd.! Spec. iv. 1089.

Hab. Tropical America: Peru, *Humboldt and Bonpland.* A single fruit still remaining on the specimen in Herb. Willd., although imperfect, clearly proves it to be a true *Mimosa*, very nearly allied to *M. guatemalensis.*

M. semispinosa, Spreng.! Syst. ii. 206, vix Linn., from a fruiting specimen in Herb. Balb., or *Acacia*

Spini, Balb.! in Spin. Cat. Suppl. ex DC. Prod. ii. 460, from a flowering specimen in the same herbarium, both from Santa Marta, from a cursory examination, appeared to be a true *Mimosa*, closely allied to, and probably identical with, *M. caduca*. The prickles in both specimens were solitary under each leaf.

******** *Aculeatæ* (M. acutistipula *et* M. arenosa *interdum inermes*), *glabræ v. laxe pubescentes.*

† *Species Brasilienses, spicis plerumque paniculatis.*

146. M. INTERRUPTA, *Benth.! in Hook. Journ. Bot.* iv. 392. Fruticosa, puberula v. glabrescens. Aculei infrastipulares oppositi. Pinnæ 5–9-jugæ; foliola multijuga, oblongo-linearia, 3–4 lin. longa, nitida, 2-nervia. Spicæ semipedales, laxifloræ. Legumen junius viscoso-villosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

147. M. ACUTISTIPULA, *Benth.! in Hook. Journ. Bot.* iv. 391. Fruticosa v. arborea, puberula. Aculei sparsi, rari, recti v. incurvi (v. nulli?). Pinnæ 5–6-jugæ; foliola multi- (ultra 30-)juga, oblongo-linearia, ad 3 lin. longa, rigidula, obtusa, basi obliqua, costa subcentrali. Spicæ densæ, 1–1½-pollicares. Legumen stipitatum, planum, 3–4-pollicare, 3–4 lin. latum, subglabrum, margine tenui, valvis 6–10-articulatis.—*Fl. Bras. Mim.*

Acacia acutistipula, Mart.! Herb. Fl. Bras. 107.

Hab. Tropical America: Brazil, prov. Piauhy and Bahia.

148. M. APODOCARPA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, puberula. Aculei sparsi, rari, recurvi. Pinnæ 12–15-jugæ; foliola multijuga, linearia, 2 lin. longa, nitidula. Spicæ sub-2-pollicares. Legumen sessile, planum, pubescens, 2–2½-pollicare, 5 lin. latum, valvis pluriarticulatis.

Hab. Tropical America: Brazil, prov. Goyaz.

149. M. HOSTILIS, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, puberula (viscidula?). Aculei sparsi, recti. Pinnæ 4–6-jugæ; foliola multijuga, oblonga, obtusissima, 1–1½ lin. longa, costa vix conspicua. Spicæ 1–2-pollicares. Legumen subsessile, planum, viscido-puberulum, pollicare v. longius, 3 lin. latum, valvis 4–6-articulatis.

Acacia hostilis, Mart.! Reise, i. 555.

Hab. Tropical America: Brazil, prov. Minas Geraes and Bahia.

150. M. OPHTHALMOCENTRA, *Mart.! Herb.; Benth. in Mart. Fl. Bras. Mim.* Fruticosa, subglabra. Aculei sparsi, recurvi, nunc rari v. subnulli. Pinnæ 1–3-jugæ; foliola 15–20-juga, linearia, 1½–2 lin. longa, nitidula. Spicæ 1½-pollicares. Legumen subsessile, planum, glabrum, 1½–3-pollicare, 2½–3 lin. latum, valvis reticulatis 6–12-articulatis.

Hab. Tropical America: Brazil, prov. Bahia.

151. M. MALACOCENTRA, *Mart.! Herb.; Benth. in Mart. Fl. Bras. Mim.* Fruticosa, pubescens. Aculei sparsi, recurvi, pauci v. rarius subnulli. Pinnæ 5–10-jugæ; foliola 20–30-juga, oblongo-linearia, ad 2 lin. longa, pallida, glabra v. ciliata. Spicæ tenues, 2–3-pollicares. Legumen stipitatum, planum, glabrescens, 2–2½-pollicare, 2–3 lin. latum, valvis lævibus 6–8-articulatis.

Acacia malacocentra, Mart.! Herb. Fl. Bras. 106.

Mimosa leiocarpa, Benth.! in Hook. Journ. Bot. iv. 391, non DC.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Minas Geraes, Bahia and Ceara.

Resembles in many respects the Columbian *M. arenosa*; but besides the difference in station and the more paniculate inflorescence, there appear to be some differences in the proportions of the parts of the flower.

152. M. CÆSALPINIÆFOLIA, *Benth.! in Hook. Journ. Bot.* iv. 392. Fruticosa, glabriuscula. Aculei sparsi, recurvi, rari. Pinnæ 3-jugæ; foliola 3-juga, late ovata, obtusissima, ½–1-pollicaria, glabra v. subtus puberula. Spicæ laxæ, 1½-pollicares. Legumen stipitatum, planum, glabrum, 2½–3-pollicare, 4–5 lin. latum, valvis 8–12-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Piauhy.

†† *Species Columbianæ v. Mexicanæ, spicis axillaribus v. summis paucis breviter racemosis.*

153. M. ADENANTHEROIDES, *Benth.! in Hook. Lond. Journ.* v. 88. Fruticosa, minute puberula. Aculei sparsi, recurvi. Pinnæ sub-9-jugæ; foliola 8–10-juga, ovato-oblonga, obtusiuscula, 3–5 lin. longa, subtus pallida v. canescentia. Spicæ tenues, 1–1½-pollicares. Flores puberuli. Legumen ignotum.

Acacia adenantheroides, Mart. et Gal.! in Bull. Acad. Brux. x. pars ii. 310.

Hab. Tropical America: Mexico, prov. Oaxaca, *Galeotti*, n. 3208.

154. M. CABRERA, *Karst.! Fl. Colomb.* ii. 63, t. 132. Fruticosa? tenuiter pubescens, pilis glanduliferis intermixtis. Aculei sparsi, recti. Pinnæ 6–9-jugæ; foliola 20–40-juga, linearia, obtusa, 2–3 lin. longa, utrinque pubescentia, concoloria. Spicæ laxæ, subinterruptæ, 2–3-pollicares. Legumina subsessilia, plana, pubescentia et glandulosa, 1–1½-pollicaria, 3–4 lin. lata, valvis 3–6-articulatis.

Acacia tenuiflora, Willd.! Spec. iv. 1088.

Mimosa tenuiflora, Poir. Dict. Suppl. i. 82, non Benth.

Hab. Tropical America: Columbia, *Fendler*, n. 1870; San Salvador, *Wendland*.

155. M. ARENOSA, *Poir. Dict. Suppl.* i. 66. Fruticosa (v. arborescens?), ramis tenuibus dense pubescentibus. Aculei sparsi, recurvi, copiosi, rari v. nulli. Pinnæ sub-7-jugæ; foliola multijuga, oblonga, 2–3 lin. longa, utrinque puberula. Spicæ tenues, laxæ, 1½–2½-pollicares. Flores subglabri. Legumen stipitatum, planum, glabrum, mucronatum, 1–1½-pollicare, 2½ lin. latum, valvis 7–8-articulatis.

Acacia arenosa, Willd.! Spec. iv. 1060 (err. 1054).

Mimosa Xantholasia, Benth.! in Hook. Lond. Journ. v. 88.

Hab. Tropical America: Columbia, *Bredemeyer*, *Funcke*, n. 383, *Fendler*, n. 360; *Otto*, n. 366, *Birschel*.

Very near *M. malacocentra*.

156. M. LEIOCARPA, *DC. Prod.* ii. 429. Fruticosa, glabra. Aculei subrecti, sparsi, rari. Pinnæ sub-12-jugæ; foliola multijuga, parva, linearia. Spicæ subpaniculatæ. Legumina plana, glabra, lucidula, marginibus incrassatis.

Hab. Tropical America: Columbia, Santa Marta, *Bertero*.

Apparently differing from *M. arenosa* in the more numerous pinnæ and the general absence of hairs; but I have no means now of comparing it, having only seen it many years since in Herb. DC. and Herb. Balbis.

157. M. WRIGHTII, *A. Gray! Pl. Wright.* ii. 52. Suffruticosa, cinereo-puberula. Aculei sparsi, breves, recti. Pinnæ 7–10-jugæ; foliola 10–15-juga, oblonga, $1\frac{1}{2}$–2 lin. longa, subavenia, supra glabrata, subtus sericea. Spicæ 1–2-pollicares, densæ. Flores glabriusculi. Legumen junius planum, angustum, dense sericeo-villosum, perfectum ignotum.

Hab. Subtropical North America: Sonora, *Wright*, n. 1041.

158. M. PLATYCARPA, *Benth.*, sp. n. Fruticosa, glabra. Aculei sparsi, recurvi. Pinnæ 6–10-jugæ; foliola 15-25-juga, linearia, 1–$1\frac{1}{2}$ lin. longa. Spicæ graciles, pollicares, laxifloræ. Legumen stipitatum, planum, glabrum, in specimine $1\frac{1}{2}$ poll. longum, fere $\frac{3}{4}$ poll. latum, apice basique angustius, marginibus aculeolatis, valvis ut videtur indivisis.

Hab. Tropical America: Guatemala, *Skinner*.

Quoad folia aculeos et legumina a *M. acantholoba* vix distinguenda, sed inflorescentia spicata nec capitata. Ramuli tenues, angulati, uti tota planta glabri v. novelli tenuissime ciliato-puberuli. Aculei parvuli, crebri v. rari, interdum deesse videntur. Stipulæ parvæ, setaceæ, rigidulæ, interdum fere pungentes. Foliorum petiolus communis gracilis, subsesquipollicaris, inermis v. pauciaculeatus. Pinnæ 6–9 lin. longæ. Foliola obtusa, glabra v. ciliolata, costa centrali. Spicæ geminæ, pleræque axillares, breviter pedunculatæ. Flores 5-meri, 10-andri.

159. M. DISTACHYA, *Cav. Ic.* iii. 48, t. 295. Fruticosa, pube minuta pallens v. candicans. Aculei infrafoliacei recurvi v. nulli. Pinnæ 2–5-jugæ; foliola 4–7-juga, obovali-oblonga, minute puberula, ad 3 lin. longa. Spicæ graciles, 1–$1\frac{1}{2}$-pollicares. Flores subsessiles. Legumen ignotum.

Acacia? distachya, DC. Prod. ii. 456.

Mimosa remota, Benth.! in Hook. Journ. Bot. v. 88.

M. oligacantha, DC. Prod. ii. 429.

Hab. Tropical America: Mexico, *Herb. Pavon, Galeotti*, n. 3240; Columbia, Santa Marta, *Bertero, Schlim*, n. 942.

Frutex v. arbor parva, ramulis rigidis flexuosis plus minus pubescentibus. Aculei dum adsunt validi, basi valde dilatati, nunc sub folio ipso solitarii, nunc ab eo plus minus remoti, nunc omnino deficientes. Stipulæ setaceæ v. subulatæ, v. in speciminibus inermibus lineari-subulatæ. Foliorum petiolus tenuis, $1\frac{1}{2}$–3-pollicaris; pinnarum rhachis raro semipollicem excedit, prope basin 2-stipellata. Foliola lætevirentia, membranacea, tenuissime 3-nervia, utrinque pilis parvis appressis puberula. Spicæ 2–3næ, inferiores axillares, summæ breviter racemosæ, floribus præsertim inferioribus subdissitis. Calyx membranaceus, truncatus, $\frac{1}{2}$ lin. longus. Corolla lineam longa, ad medium 5-fida v. rarius 4-fida, membranacea, glabriuscula. Stamina longe exserta.

Although the Mexican specimens are usually unarmed, or nearly so, and the Columbian ones have usually strong prickles, I can discover no other difference; and almost all the prickle-bearing species of this series show occasionally specimens without any.

160. M. POLYANTHA, *Benth.! in Hook. Journ. Bot.* iv. 410. Fruticosa, puberula. Aculei infrafoliacei recti v. subrecurvi. Pinnæ 2-, rarius 3-jugæ; foliola 3–6-juga, oblonga, obtusa, 2–3 lin. longa, supra glabra, subtus parce pilosula. Spicæ floribundæ, $\frac{1}{2}$–$\frac{3}{4}$ poll. longæ. Flores subsessiles. Legumen ignotum.

Hab. Tropical America: Mexico, *Herb. Pavon*, Acatlan, *Andrieux*, n. 397, and perhaps also *Coulter*, n. 401.

M. distachyæ valde affinis, differt habitu, foliis per anthesin vix evolutis, spicis ad nodos confertis brevibus, aculeis plerisque rectis, foliolis supra glabris.

161. M. LAXIFLORA, *Benth. ! in Hook. Lond. Journ.* v. 93. Glabra, pallida. Aculei sparsi, recurvi, rari. Pinnæ 2–3-jugæ; foliola 3–6-juga, oblonga, obtusa, ad 3 lin. longa. Spicæ graciles, vix pollicares, glabræ. Flores distincte pedicellati. Legumen ignotum.

Hab. Subtropical North America: Mexico, prov. Sonora Alta, *Coulter*.

It is possible that a more perfect series of specimens may induce the uniting the three preceding species into a single one; but they appear distinct, and the fruits are not known of any of them.

Acacia prosopoides, DC. Prod. ii. 460, described from one of Moçino and Sessé's Mexican drawings, may possibly, from the very short character given, be the same as *M. laxiflora*, although more probably *Piptadenia patens*.

Series 2. Glanduliferæ. *Frutices sæpius alte scandentes, aculeis sparsis recurvis parvis minimisve armati. Pinnæ 2- multijugæ. Foliola pauci- v. multi-juga. Glandula ad basin petioli communis, et sæpe parvæ ad foliorum paria ultima. Capitula globosa, parva, ad apices ramorum ample paniculata. Legumen planum, margine tenui nerviformi nudum, valvis pluriarticulatis.*

162. M. BAUHINIÆFOLIA, *Karst. ! Fl. Colomb.* ii. 65, t. 133. Glabra. Aculei sæpe validi. Pinnæ 2-jugæ; foliola 1-juga, falcato-ovata, obtusa, 3–4-pollicaria; glandula petiolaris depressa. Legumen glabrum, 3–4 poll. longum, 6–8 lin. latum, valvis multiarticulatis.

Hab. Tropical America: Columbia near Villavicencio, *Karsten*, *Triana*.

163. M. EXTENSA, *Benth. ! in Hook. Journ. Bot.* iv. 393. Alte scandens, glabra. Aculei minimi. Pinnæ 2–3-jugæ; foliola 1-juga, falcato-ovata, breviter acuminata, $1\frac{1}{2}$–4-pollicaria; glandula petiolaris verruciformis. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

164. M. MICRACANTHA, *Benth. ! in Hook. Journ. Bot.* ii. 131, iv. 393. Alte scandens, puberula v. glabra. Aculei minimi. Pinnæ 2–3-jugæ; foliola 2–3-juga, oblique ovata, obtusa, 2–3-pollicaria; glandula petiolaris parvula, elevata. Legumen glabrum, 2-pollicare, 9 lin. latum, valvarum articulis ad 8, latioribus quam longis.—*Fl. Bras. Mim.*

Hab. Tropical America: North Brazil.

165. M. RUFESCENS, *Benth. in Mart. Fl. Bras. Mim.* Alte scandens, puberula v. glabra. Aculei minimi, rari. Pinnæ 2–6-jugæ; foliola 3–7-juga, oblique obovata, obtusa, glabra v. subtus ad axillas venarum pilosula, variant $\frac{1}{2}$–$1\frac{1}{2}$-pollicaria; glandula petiolaris verruciformis. Legumen glabrum, 4-pollicare v. longius, $\frac{1}{2}$ poll. latum, valvarum articulis 8 pluribusve.

Hab. Tropical America: North Brazil.

166. M. SPRUCEANA, *Benth. ! in Mart. Fl. Bras. Mim.* Alte scandens, rufo-villosa. Aculei minimi, sparsi, recurvi. Pinnæ sub-3-jugæ; foliola 4–6-juga, oblique obovata, majora $1\frac{1}{2}$–3-pollicaria, subtus molliter tomentoso-villosa, inferiora minora. Legumen

planum, puberulum v. glabratum, 3–4-pollicare, ¾–1 poll. latum, valvis multiarticulatis.

Hab. Tropical America: North Brazil,

167. M. ANNULARIS, *Spruce, Benth.! in Mart. Fl. Bras. Mim.* Alte scandens, rufo-tomentosa. Aculei parvi, sparsi, recurvi. Pinnæ sub-3-jugæ; foliola 4–6-juga, oblique rhombea, acutiuscula, ¼–1-pollicaria, subtus sparse pubescentia. Legumen planum, glabrum, 4 lin. latum, valde curvum v. perfecte annulatum, valvis multiarticulatis.

Hab. Tropical America: North Brazil.

168. M. PANICULATA, *Benth.! in Hook. Journ. Bot.* ii. 131, iv. 394. Alte scandens, pubescens. Aculei parvi, sparsi, recurvi. Pinnæ 5–7-jugæ; foliola 7–11-juga, oblique falcato-rhombea, acutiuscula, 4–5 lin. longa, supra lucida, subtus pubescentia. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: North Brazil or British Guiana.

Series 3. Rubicaules. *Frutices alte scandentes v. erecti, rarius arborescentes, aculeis sparsis armati v. rarius inermes. Foliorum petiolus eglandulosus. Capitula globosa, sæpius multiflora, ad apices ramorum racemosa v. paniculata, v. rarius omnia axillaria. Flores* 3-*meri*, 4-*meri v. rarius* 5-*meri. Legumen planum, glabrum v. pubescens, margine aculeatum v. nudum, valvis membranaceis, in articulos plures secedentibus v. rarius* (*in* M. acantholoba) *indivisis.*

The want of the petiolar gland is the principal difference between this series and the *Glanduliferæ*; but it is also usually distinguished by the habit and foliage, the larger heads with more flowers etc. It passes, however, rather gradually into the *Acanthocarpæ*. The *Asperatæ Schrankioideæ* come also very near to some of the present section, but appear to me to be more nearly connected with the setose groups.

* *Gerontogeæ.*

† *Calyx corollæ dimidium subæquans.*

169. M. EMIRNENSIS, *Benth. in Hook. Journ. Bot.* iv. 396. Fruticosa? tomentoso-puberula, inermis? Pinnæ 6–10-jugæ, paribus distantibus; foliola 5–8-juga, oblonga, ad 2 lin. longa, utrinque adpresse puberula. Panicula ampla, polycephala. Legumen sessile, puberulum, inerme, 1½–2-pollicare, 4–5 lin. latum, valvis pluriarticulatis.

Hab. Madagascar: Mazou-arivou, prov. Emirna, *Bojer.*

Very near *M. latispinosa*, but apparently entirely unarmed, the foliage rather different, and the pod sessile and scarcely contracted at the base in all the specimens seen.

170. M. LATISPINOSA, *Lam. Dict.* i. 22. Fruticosa, subscandens, tomentoso-pubescens. Aculei in ramis rari, in petiolis frequentiores, latissimi, recti v. incurvi. Pinnæ 10–25-jugæ; foliola 10–20-juga, oblonga, obtusa, 1½–2½ lin. longa, obscure 1–3-nervia, utrinque appresse puberula. Panicula ampla, polycephala. Legumen stipitatum, 1½–2-pollicare, 4–5 lin. latum, margine nudo v. parce aculeolato, valvis pluriarticulatis.

Acacia latispinosa, Desf.! Cat. Hort. Par. ed. 3. 299.

Mimosa mascarensis, Spreng. Syst. ii. 207 ex char.

M. phyllocantha, Pers. Syn. ii. 267.

Hab. Madagascar, *Commerson, Bojer.* Cultivated in the Botanic Gardens of Mauritius

and Calcutta as well as in European ones; and specimens having been found in Leichhardt's Port-Essington collection, it was sent by F. Mueller as the only Australian *Mimosa* under the name of *M. laticuspis*. It was, however, probably from one of the exotic trees and shrubs planted there by the temporary colonists.

171. M. DECURRENS, *Bojer! in Herb. DC.* Fruticosa, glabra v. vix minute puberula. Aculei in ramis rari, in petiolis frequentiores, latissimi, incurvi. Pinnæ 10–20-jugæ; foliola 6–8-juga, oblonga, 3–5 lin. longa, sub-2-nervia, glabra. Capitula ad axillas racemosa (an etiam ample paniculata?). Legumen ignotum.

Hab. Tropical Africa: island of Zanzibar, *Bojer*.

Affinis *M. latispinosæ*, imprimis glabritie diversa, pinnis brevibus, foliolis majoribus. Tota planta oculo nudo glaberrima apparet, sub lente pubes rara tenuissima apparet. Ramuli angulati. Foliorum petiolus communis semipedalis et longior. Aculei ut in *M. latispinosa* valde dilatati et incurvi nec ut in *M. rubicauli* recurvi. Foliola valde obliqua, rigide membranacea v. subcoriacea, nervo majore (seu costa) margini superiori approximato. Racemi in specimine viso simplices, folia æquantes. Capitula et flores *M. latispinosæ* sed glabri.

†† *Calyx minimus, corolla quadruplo brevior.*

172. M. NISSOBIENSIS, *Benth.*, sp. n. Fruticosa, scandens, glabra. Aculei sparsi, recurvi, parvi. Pinnæ 4–6-jugæ; foliola 6–12-juga, late oblonga, obtusissima, membranacea, 4–6 lin. longa, glabra. Panicula ampla. Legumen ignotum.

Hab. Madagascar: island of Nossi-bé, *Boivin*.

Habitu *M. sepiariæ*, et pariter siccitate nigrescit, foliolis facile distinguenda. Petiolus communis 3–4-pollicaris, pinnæ 1½–2-pollicares. Foliola 2–3 lin. lata, basi valde obliqua, costa subcentrali, nervis lateralibus 2–3 tenuibus brevibus. Panicula aphylla, laxe polycephala. Capitula multiflora. Calyx vix ¼ lin. longus. Corolla 1 lin. longa, profunde 4-fida.

The Brazilian *M. sepiaria* has established itself in hedges in Singapore and in South China.

173. M. RUBICAULIS, *Lam. Dict.* i. 20. Fruticosa, subscandens, puberula. Aculei sparsi, recurvi. Pinnæ 3–10-jugæ; foliola 6–15-juga, oblonga v. oblongo-linearia, 2–4 lin. longa, subtus v. utrinque appresso-puberula. Pedunculi inferiores axillares, superiores racemosi. Legumen stipitatum, rectum v. curvum, 2–3-pollicare, 4–6 lin. latum, margine nudum v. rarius aculeatum, glabrum, valvis pluriarticulatis.—*Hook. Ic. Pl.* t. 156.

Mimosa octandra, Roxb.! Pl. Corom. ii. 55, t. 200.
M. mutabilis, Roxb. Fl. Ind. ii. 564.
M. spinoso-siliqua, Rottl. ex Spreng. Syst. ii. 206.
M. Rottleri, Spreng. *l. c.*

Hab. Tropical Asia: widely spread over East India from Affghanistan and the Peninsula to Nepaul and Assam, and has also been received from Mauritius, but perhaps there cultivated.

174. M. HAMATA, *Willd. Spec.* iv. 1033. Fruticosa, cano-puberula. Aculei sparsi, validi, recti v. recurvi. Pinnæ petiolo brevi 3–4-jugæ; foliola 6–10-juga, oblonga v. oblongo-linearia, 1–2 lin. longa, utrinque cano-puberula. Pedunculi plerique axillares, folio longiores. Legumen stipitatum, pubescens, curvum, ad 6 lin. latum, latere exteriore inter semina sinuatum, margine aculeato, valvis pluriarticulatis.

M. armata, Rottl.! Spreng. Syst. ii. 206.

Hab. Tropical Asia: East-Indian peninsula.

M. rubicauli valde affinis, vix differt nisi pube, foliis pinnisque brevibus, foliolis minoribus, aculeis validioribus, legumine latiore magis armato sæpissime minuto.

Amongst the Peninsular specimens of *M. hamata* are a few from Wight and others approaching nearer to *M. rubicaulis,* but apparently differing from both in their glabrous leaves and pods, and in the foliage precisely that of the American *M. polyancistra,* from which, indeed, the specimens show no distinction that I can discover. The specimens, however, from both regions are insufficient to determine whether they are really specifically identical, and, if so, which is their real native country.

175. M. PSORALEA, *Benth.* Fruticosa? glabra, verruculosa. Aculei sparsi, recurvi. Pinnæ 2–5-jugæ; foliola 7–8-juga, oblongo-linearia, obtusa, glabra, vix 2 lin. longa. Pedunculi axillares. Legumen ignotum.

Acacia? psoralea, DC. Prod. ii. 464.

Hab. Madagascar, *Commerson.* Of this I have only seen a fragment, in Herb. DC., insufficient for a full description. It is evidently nearly allied to *M. rubicaulis.*

176. M. VIOLACEA, *Bolle in Peters, Mossamb. Bot.* 8. Diffusa v. subscandens, ramis tenuibus pubescentibus glabrisve. Aculei sparsi, parvi, recurvi. Pinnæ 5–15-jugæ. Foliola 8–12-juga, oblongo-linearia, 2–3 lin. longa. Pedunculi axillares, tenues, subfiliformes. Legumen stipitatum 3-pollicare, 4–6 lin. latum, omnino *M. rubicaulis.*—*Oliv.! Fl. Trop. Afr.* ii. 336.

Hab. Tropical Africa: Mossambique district.

** *Americanæ.*

† *Inermes. Foliola obovata v. late oblonga, obtusissima.*

177. M. LEUCÆNOIDES, *Benth.! in Hook. Lond. Journ.* v. 89. Fruticosa, minute puberula. Pinnæ 1-jugæ; foliola 2–4-juga, obovata v. subrhombea, $\frac{3}{4}$–1-pollicaria, coriacea, venosa, nitida; glandula nulla. Capitula axillaria, pedunculata. Legumen sessile, 2–$2\frac{1}{2}$-pollicare, curvulum, 2–4 lin. latum, minute puberulum v. glabratum, inerme, valvis pluriarticulatis.

Hab. Tropical America: Mexico, *Coulter, Karwinski.*

178. M.? PISTACIÆFOLIA, *Willd.! Spec.* iv. 1028. Glaberrima. Pinnæ 1-jugæ, petiolo $\frac{1}{2}$–$\frac{3}{4}$-pollicari supra canaliculato eglanduloso; foliola 3-juga, obovata v. obovato-oblonga, obtusissima, pollicaria, coriacea, nitidula, 4–5-nervia et parce venulosa; glandula scutellata inter foliola paris ultimi. Cætera ignota.

Inga pistaciæfolia, Spreng. Syst. iii. 131.

Hab. Tropical America: Caraccas, *Bredemeyer.*

The foliage of the specimen in Herb. Willd. is very nearly that of *M. leucænoides,* but glabrous, and the gland is quite exceptional. It may therefore very possibly belong to some other genus.

179. M. ECHINOCAULA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa; rami setis longis rigidis echinati, cæterum glaberrima et inermis. Pinnæ remote 3–4-jugæ; foliola 7–10-juga, late oblonga, obtusissima, subsemipollicaria, crassiuscula, glaucescentia, præter costam avenia. Capitula longe racemosa. Legumen breviter stipitatum, 2–$2\frac{1}{2}$-pollicare, $2\frac{1}{2}$ lin. latum, glabrum, inerme, valvis multiarticulatis.

Hab. Tropical America: Brazil, prov. Bahia and Minas Geraes.

†† *Aculeatæ. Foliola obovata v. late oblonga.*

180. M. OBOVATA, *Benth.! in Hook. Journ. Bot.* iv. 394. Fruticosa, alte scandens, glabra. Aculei sparsi, recurvi. Pinnæ 2–4-jugæ; foliola 1-juga, rarius 2-juga, obovata, 1–1½-pollicaria, pennivenia, sub-2-nervia. Capitula parva, paniculata. Flores sæpius 3-meri. Legumen 2–3-pollicare, 6 lin. latum, glabrum, inerme, valvis 5–8-articulatis.—*Fl. Bras. Mim.*

Acacia? guilandinæ, DC.! Prod. ii. 465.

Mimosa ceratonioides, Klotzsch! in Herb. Berol.

Hab. Tropical America: Brazil, prov. Bahia and Rio Janeiro, Venezuela, and perhaps Guiana.

181. M. CERATONIA, *Linn.! Spec.* 1508. Repens v. scandens, glaberrima. Aculei sparsi, parvi, recurvi, crebri. Pinnæ 3–5-jugæ; foliola 3-juga, obovata v. orbiculata, obtusissima, semipollicaria v. paullo majora, membranacea, 3-nervia. Capitula laxe racemosa. Legumen sessile, 2–2½-pollicare, 9 lin. latum, margine aculeatum, valvis 6–8-articulatis.

Acacia ceratonia, Willd. Spec. iv. 1091.

Hab. Tropical America: West-Indian Islands, St. Vincent's, St. Lucia, St. Thomas, Dominica, perhaps also on the S. American continent, but the *M. obovata* often mistaken for it.

182. M. FAGARACANTHA, *Griseb.! Cat. Pl. Cub.* 81. Fruticosa, tortuosa, glabra. Aculei infrastipulares petiolaresque gemini recurvi, et nonnunquam sparsi. Pinnæ 2–3-jugæ; foliola 2–4-juga, obovata v. ovalia, obtusissima, 2–4 lin. longa, sub-3-nervia. Capitula parvula, racemosa v. inferiora axillaria. Legumen subsessile, 2-pollicare, 3–4 lin. latum, inerme v. minute aculeatum, valvis 6–8-articulatis.

Hab. Tropical America: Cuba, *Wright*, n. 2390.

183. M. POLYANCISTRA, *Benth. in Herb. Boiss.* Fruticosa, scandens?, glabra. Aculei sparsi, recurvi, copiosi. Pinnæ 3–7-jugæ; foliola 6–8-juga, oblique obovali-oblonga, obtusa, 3–4 lin. longa, sub-2-nervia. Capitula racemosa. Legumen ignotum.

Acacia tamarindifolia, Griseb.! Cat. Pl. Cub. 82, excl. syn.

Hab. Tropical America: New Spain, *Pavon*; cultivated in Mr. Chapy's garden at Havannah from the West Indies, *M'Lane*.

This approaches in many respects the nearly glabrous variety of *M. malacophylla*, but is at once distinguished by the very obtuse leaflets without the mucro of that species. It is, however, still nearer the East-Indian *M. rubicaulis*, and is absolutely undistinguishable, in as far as the specimens show, from the East-Indian Peninsular species or variety mentioned above under *M. hamata*; insomuch that we might have supposed that the Cuban garden specimens had been raised from East-Indian seeds, had it not been for the typical New-Spain specimens which I described from Pavon's collection in Boissier's herbarium.

184. M. BAHAMENSIS, *Benth.! in Hook. Journ. Bot.* iv. 408. Fruticosa, ramis petiolis pedunculisque dense rubiginoso-tomentosis. Aculei sparsi, recurvi, pauci. Pinnæ 2–4-jugæ; foliola 3–6-juga, obovali-oblonga, obtusissima, 1–1½ lin. longa, uninervia, fuscescentia, glabra v. minute puberula. Capitula racemosa v. infima pauca axillaria. Legumen ignotum.

Hab. Tropical America: Bahama Islands, *Herb. Hook.*

185. M. MALACOPHYLLA, *A. Gray! Pl. Lindh.* ii. 182. Suffruticosa, ramis laxis molliter tomentoso-pubescentibus. Aculei parvi, sparsi, recurvi. Pinnæ 4–7-jugæ; foliola 5–8-juga, obovata v. late oblonga, mucronulata, 3–5 lin. longa, pennivenia, utrinque molliter pubescentia v. rarius glabrata. Capitula racemosa subpaniculata. Legumen longe stipitatum, 2–3-pollicare, 4–6 lin. latum, glabrum, nitidum, inerme, valvis reticulatis indivisis v. in articulos 6–8 secedentibus.

Hab. Extratropical N. America: Mexican-Texan region, *Wright*, n. 143, *Emory's Expedition*, n. 309, and several others.

Var. *glabrata*, ramis petiolisque tenuiter puberulis, foliolis glabris.—*Berlandier*, n. 815 and 2235.

186. M. COSTARICENSIS, *Benth. in Herb. Œrst.* Fruticosa, scandens?, molliter ferrugineo-tomentosa. Aculei sparsi, parvi, recurvi, copiosi. Pinnæ 4–8-jugæ; foliola 10–15-juga, late oblonga, mucronulata, 3–4 lin. longa, pennivenia, supra puberula, subtus villosa. Capitula parva, stricte globosa, paniculata. Legumen ignotum.

Hab. Tropical America: Aguacate in Costa Rica, *Œrsted*; New Spain, *Herb. Pavon.*

E speciminibus frutex apparet scandens, *M. caducæ* subsimilis, sed capitulis stricte globosis nec oblongis et floribus minoribus subglabris statim dignoscitur. Ramuli angulati, uti petioli pube molli densa obtecti, aculeis ad angulos crebris. Stipulæ subulatæ, tomentosæ, 2–4 lin. longæ. Foliorum petiolus communis 4–5-pollicaris. Pinnæ 1½–2-pollicares. Foliola iis *M. malacophyllæ* similia sed numerosiora, valde obliqua, costa tamen parum excentrica. Pedunculi secus rhachin racemi sæpius gemini, 3–5 lin. longi. Bracteæ flore multo breviores. Calyx breviter dentatus, corolla 4-mera (rarius 5-mera?) triplo brevior. Stamina 8 v. ex Pavon 10.

††† *Aculeatæ. Foliola linearia, multijuga.*

187. M. BERLANDIERI, *A. Gray in Torr. Bot. Emory Exped.* 61. Fruticosa, erecta. Rami juniores puberuli, setisque brevioribus parce strigosi. Aculei sparsi, breves, recti. Pinnæ 4–6-jugæ; foliola 20–40-juga, linearia, acutiuscula, glabella, obsolete 3–4-nervia. Capitula racemoso-paniculata. Legumen breviter stipitatum, oblongo-lineare, nudum, hirtellum, valvis 8–10-articulatis.—*Char. ex A. Gr.*

Hab. Extratropical North America: Mexican-Texan region, *Berlandier*, n. 3146, *Schott.* I have seen no specimen.

188. M. SEPIARIA, *Benth.! in Hook. Journ. Bot.* iv. 395. Fruticosa v. arborescens, glabra v. puberula. Aculei sparsi, validi, recti, in ramis floridis rari. Pinnæ 4–8-jugæ; foliola multijuga, linearia, nitida, 3–4 lin. longa, venosa. Capitula ample laxeque paniculata. Legumen stipitatum, ad 2 poll. longum, 3 lin. latum, glabrum, nudum, valvis pluriarticulatis.—*Fl. Bras. Mim.*

Acacia bimucronata, DC. Prod. ii. 469.

Hab. Tropical America: very common, and frequently planted in hedges throughout South Brazil, and also met with in woods, where it grows into a small handsome tree. Also in hedges in South China, *Fortune*, n. 17, and in Singapore, *Schomburgk*, *Maingay*, who sent it as a new species under the name of *M. nigrescens*, but must surely have been introduced from South Brazil. *M. thyrsoidea*, Griseb. Fl. Brit. W. Ind. 219, gathered in Jamaica by Wullschnagel, which I have not seen, must also, from Grisebach's character,

be the same plant, probably cultivated, as are many of the Surinam plants in Wullschnagel's collections. No such plant occurs in any of the numerous Jamaican collections we have.

189. M. INAMŒNA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, erecta, glabra v. patentim pilosula. Aculei sparsi, recti v. subrecurvi. Pinnæ dissite 6–10-jugæ: foliola 6–15-juga, oblongo-linearia, $\frac{1}{2}$–2 lin. longa. Capitula parva, racemosa, subpaniculata. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Goyaz.

190. M. DIPLACANTHA, *Benth.*, sp. n. Fruticosa, glabra v. minute cano-puberula. Aculei recurvi, in ramis rari, in petiolo sub pinnis gemini. Pinnæ 2- rarius 3-jugæ; foliola 6–10-juga, lineari-oblonga, obtusa, 2 lin. longa, crassiuscula, enervia. Capitula ad nodos fasciculata. Legumen stipitatum, sesquipollicare, $2\frac{1}{2}$ lin. latum, glabrum, nudum, valvis 6–8-articulatis.

Hab. Tropical America: "Antilles," *Herb. Berol.*, from *Herb. Mus. Par.*

Habitus *Acanthocarpearum* nonnullarum, affinitas tamen potius *M. fagaracanthæ* v. *M. polyancistræ*. Ramuli et petioli minute cano-puberuli. Folia cæterum uti flores glabri. Pinnæ sæpissime 2-jugæ, paribus distantibus, semipollicares v. paullo longiores. Pedunculi $\frac{1}{4}$–$\frac{3}{4}$-pollicares, cum foliis ad nodos v. in ramulis brevissimis fasciculati. Capitula subglobosa, floribus numerosis sessilibus 4-meris. Calyx turbinatus, $\frac{1}{2}$ lin. longus. Corolla membranacea, vix linea longior. Stamina 8, corolla duplo longiora. Leguminis articuli paullo longiores quam lati.

191. M. DOMINGENSIS, *Benth. in Hook. Journ. Bot.* iv. 409, *quoad syn. DC.* Fruticosa, glabriuscula. Aculei recurvi, in ramis rari, in petiolo sub pinnis gemini. Pinnæ 3–5-jugæ; foliola 6–8 juga, oblongo-linearia, obtusa. Capitula globosa v. ovoidea, ad apices ramorum subpaniculata. Legumen stipitatum, falcatum, glabrum, nudum, valvis pluriarticulatis.

Acacia domingensis, Bert.! in DC. Prod. ii. 464.

I have now been unable to compare Bertero's specimens, which I saw some years since, with those I formerly described from the Berlin Herbarium, or with the *M. diplacantha*, which I have now described; all are evidently closely allied, but, I believe, belong to two species, one with a terminal the other with an axillary inflorescence, and all allied also to *M. polyancistra*, but with narrow leaflets and the habit of the *Acanthocarpæ*. St.-Domingo plants, however, are generally as yet but very imperfectly known.

Series 4. Acanthocarpæ. *Frutices ramosissimi v. rarius suffrutices, glabri pubescentes v. villosi, nec setosi* (*excepta* M. Galeottii), *aculeis infrastipularibus sparsisve armati v. rarius inermes. Stipulæ et stipellæ parvæ, setaceæ. Pinnæ pauci- v. multijugæ. Capitula globosa v. rarius ovoidea, ad axillas v. nodos pedunculata, rarius ad apices ramorum breviter racemosa. Flores 4-meri v. sæpius 5-meri. Calyx breviter dentatus nec ciliatus. Legumen planum, sæpe falcatum, glabrum v. pubescens, margine nudo v. more* Rubicaulium *aculeato, valvis nudis v. rarius setoso-echinatis, indivisis a margine solvendis v. tardius in articulos secedentibus.*

Inflorescence, habit, and the undivided valves of the pod are the chief characters which separate the *Acanthocarpæ* from the *Rubicaules*; but none of them is constant. In *M. fragrans* the pod-valves are usually, but not always articulate; in *M. detinens*, *M. borealis*, and *M. montana*, they are frequently so;

and I have found them occasionally breaking up into articles in several others; but in all the species they appear, sometimes at least, if not generally, to fall away without any transverse separation.

* *Petiolus glandulifer (in cæteris eglandulosus).*

192. M. UNCINELLA, *Poir. Dict. Suppl.* i. 80. Fruticosa, glabra v. cinereo-puberula. Aculei infrastipulares solitarii v. gemini, recurvi. Pinnæ sub-8-jugæ, petiolo basi glandulifero; foliola sub-12-juga, linearia, obtusa, parva, puberula. Capitula axillaria, pedunculata. Legumen lineare, falcatum, glabrum, margine exteriore recurvo-aculeato. —*Char. ex Poir.*

Acacia uncinella, Desf. Cat. Herb. Par. ed. 3. 299.

Hab. . . . . Cultivated in the Paris Garden.

I have not seen this species, which is as yet doubtful. A specimen in Herb. J. Gay, given to him as from the Paris Garden under the name of *M. uncinella*, has not the petiolar gland nor some other characters given by Poiret, and is without doubt the *M. acanthocarpa*, which has long been in European botanic gardens.

193. M. REVOLUTA, *Benth. in Hook. Journ. Bot.* iv. 409. Fruticosa, glabriuscula. Aculei infrafoliacei v. infrastipulares, solitarii v. gemini, subrecti. Pinnæ 2-6-jugæ; glandula scutellata sub jugo infimo et interdum ad juga 1–2 ultima; foliola 6–10-juga, oblongo-linearia, acutiuscula, 1–2 lin. longa, glabra, costa submarginali. Capitula pedunculata, axillaria v. summa racemosa. Legumen sessile, curvum v. circinatum, 4 lin. latum, margine aculeato, valvis indivisis.

Acacia revoluta, Kunth! Mim. 84, t. 26.

Hab. Tropical America: Caxamarca in Peru, *Humboldt and Bonpland*; Bolivia, *Brydges, D'Orbigny*, n. 487.

The Bolivian specimens have rather more numerous pinnæ than Humboldt and Bonpland's; but all appear to belong to one species remarkable for the petiolar glands.

** *Aculei infrafoliacei solitarii, recurvi. Legumen sæpius margine aculeatum.*

194. M. DEPAUPERATA, *Benth.! Pl. Hartw.* 13, *et in Hook. Journ. Bot.* iv. 410. Fruticosa, glabriuscula. Pinnæ 1–2-jugæ; foliola 2–3-juga, ovato-orbiculata, linea breviora, cano-puberula. Capitula axillaria, breviter pedunculata. Legumen ignotum.

Acacia canescens, Mart. et Gal.! in Bull. Acad. Brux. x. pars ii. 312.

Hab. Tropical America: Mexico, plains of Actopan, *J. G. Graham, Karwinski.*

195. M. ZYGOPHYLLA, *Benth.! in A. Gray, Pl. Wright* i. 61. Fruticosa, glabra. Pinnæ 1-jugæ; foliola 1-juga, suborbiculata, glabra, 1–1¼ lin. longa. Capitula axillaria, longiuscule pedunculata. Legumen breviter stipitatum, 1–1½ poll. longum, 2–2½ lin. latum, subfalcatum, glabrum, margine nudum v. parce aculeatum, valvis indivisis.

Hab. Subtropical North America: Mexican-Texan region, *Gregg, Wislizenus.*

196. M. MONANCISTRA, *Benth.! Pl. Hartw.* 12 *et in Hook. Journ. Bot.* iv. 410. Fruticosa, incana. Pinnæ 2–4-jugæ; foliola 5–6-juga, oblonga, obtusa, vix lineam longa, subtus puberula. Capitula axillaria, pedunculata. Legumen ignotum?

Hab. Tropical America: Mexico, Aguas Calientes, *Hartweg.*

An huc pertinent specimina fructifera manca Berlandieri n. 2251 et 3145?, foliis subconformibus.

Legumen 1–1½-pollicare, ad 3 lin. latum, inter semina constrictum, undique cano-pubescens, valvis præterea setoso-echinatis, indivisis v. tardius in articulos 4–6 secedentibus.

*** *Aculei sparsi, recurvi. Legumen sæpius margine aculeatum.*

197. M. DETINENS, *Benth. ! in Hook. Lond. Journ.* v. 89. Fruticosa, glabra v. canescens. Pinnæ 1-jugæ; foliola 4–6-juga, oblique oblonga, obtusa, fere 2 lin. longa, glaucescentia. Capitula axillaria, pedunculata. Legumen stipitatum, glabrum, glaucum, 1½–2-pollicare, 4–5 lin. latum, margine aculeatum v. nudum valvis tardius in articulos 4–6 secedentibus.

Hab. Extratropical South America: Cordova and St. Iago, *Tweedie.*

198. M. BOREALIS, *A. Gray ! Pl. Fendl.* 39. Fruticosa, glaberrima. Pinnæ 1–2-jugæ; foliola 3–5-juga, conferta, oblonga, ad lineam longa. Capitula axillaria, pedunculata. Legumen 1–2-pollicare, 3–4 lin. latum, glabrum, glaucum, margine aculeatum, valvis indivisis v. tardius in articulos 4–6 secedentibus.

Hab. Extratropical North America: Texas, *Fendler, Wright,* n. 1038, *Emory's Expedition,* n. 307, *and others.*

The Texan variety, *Wright,* n. 159, mentioned by A. Gray, Pl. Wright. i. 61, may possibly prove a distinct species. The *M. borealis* is altogether nearly allied to the southern *M. detinens.*

199. M. EMORYANA, *Benth.*, sp. n. Fruticosa? Pinnæ 1–2-jugæ. Foliola 3–5-juga, conferta, oblonga, 1–2 lin. longa, utrinque molliter subappresse villosa. Capitula axillaria, pedunculata. Legumen 1–1½-pollicare, 2–3 lin. latum, molliter pubescens et setoso-echinatum.

Hab. Mexican-Texan region, *Emory's Expedition,* n. 302.

In habit, and size, and number of leaflets this is near to *M. borealis*; but the leaves are densely villous, and the pods are only like those of Berlandier's specimens referred doubtfully to *M. monancistra.* They are not, however, quite ripe in the single specimen seen. The peduncles, about 1 in. long, have one or two small prickles.

200. M. ACANTHOLOBA, *Poir. Dict. Suppl.* i. 83. Fruticosa, puberula. Pinnæ 4–10-jugæ; foliola 15–30-juga, oblongo-linearia, subtus pubescentia, 2–3 lin. longa. Capitula pedunculata, inferiora axillaria, superiora racemosa. Legumen stipitatum, membranaceum, 1½–2-pollicare, ad ¾ poll. latum, puberulum v. glabratum, apice basique acute angustatum, margine leviter aculeato, valvis indivisis.—*Benth. ! Bot. Sulph.* 90.

Acacia acantholoba, Humb. et Bonpl. ! in Willd. Spec. iv. 1089.

Acacia Courrantiana, DC. ! Prod. ii. 465.

Hab. Tropical America: Guayaquil, *Humboldt and Bonpland, and several others.*

The pod, exceptional in the series for its breadth and shape, is almost exactly the same as in *M. platycarpa,* placed above among the *Leptostachyæ* on account of its spicate inflorescence.

**** *Aculei sparsi, rameales recti v. leviter curvi, validi; petioli inermes. Legumen sæpissime inerme.*

201. M. FRAGRANS, *A. Gray ! Pl. Lindh.* ii. 182. Fruticosa, glaberrima. Pinnæ 1–3-jugæ; foliola 5–6-juga, lineari-oblonga, 1½–2 lin. longa. Capitula axillaria, pedunculata. Corolla calyce quadruplo longior. Legumen subsessile v. breviter stipitatum, subbipollicare, ad 3 lin. latum, margine nudum v. rarissime pauciaculeatum, valvis in articulos 4–8 sæpius secedentibus.

Hab. Extratropical North America: Mexican-Texan region.

Very closely allied to the following species; but, besides the widely distant station, the calyx is certainly much smaller in proportion to the corolla.

202. M. MONTANA, *Kunth! Mim.* 31, t. 10. Fruticosa, puberula, glabrescens. Pinnæ 2–3-jugæ; foliola 4–6-juga, oblonga, obtusa, ad 2 lin. longa, puberula. Capitula axillaria, pedunculata. Corolla calyce duplo longior. Legumen subsessile, 1–1½-pollicare, 3 lin. latum, margine nudum, valvis in articulos 6–8 sæpius secedentibus.

Hab. Tropical America: near Caxamarca, in the Peruvian Andes, *Humboldt and Bonpland*; hedges and fields, Azoque, Ecuador, *Hartweg*.

203. M. ANDINA, *Benth.*, sp. n. Fruticosa, puberula v. glabrescens. Pinnæ 2–3-jugæ; foliola 8–10-juga, oblongo-linearia, 3 lin. longa, glabra. Capitula pedunculata, inferiora axillaria, pleraque ad apices ramorum racemosa. Corolla calyce triplo longior. Legumen sessile, 1–1½-pollicare, 4–5 lin. latum, margine nudum, valvis reticulatis indivisis.

Hab. Tropical America: Andes of Ecuador, near Huataxi, frequent, *Spruce*, n. 6058.

M. montanæ affinis, sed omnibus partibus major validior. Frutex est sæpe subarborescens, 12-pedalis, partibus novellis minute puberulis, demum glabrescens. Aculei sparsi, recti, validi. Foliorum petiolus communis 1–2-pollicaris, eglandulosus, multo validior quam in *M. montana*. Pinnæ 1–1½-pollicares, paribus dissitis. Foliola crassiuscula, costa tenui vix prominula, cæterum avenia. Capitula globosa, glabra, pedunculo subpollicari. Corolla linea paullo longior. Legumen curvulum, nitidulum, reticulato-venulosum, rigidius quam in *M. montana* et divisiones nullas inter semina ostendens.

204. M. GONOCLADA, *Benth. in Herb. DC.* Fruticosa, ramis sulcatis ad angulos scaberrimis. Pinnæ 2–4-jugæ; foliola 4–8-juga, oblonga, 1½ lin. longa, puberula. Capitula axillaria, breviter pedunculata. Legumen ignotum.

Hab. Tropical America: Yungas in Bolivia, *D'Orbigny*, n. 387.

Frutex videter *M. montanæ* affinis, sed statim ramulis insigniter angulato-sulcatis dignoscendus. Aculei sparsi, recti. Foliorum petiolus communis canescenti-puberulus, rarius semipollicem excedens. Pinnæ semipollicares. Foliola rigidula, iis *M. montanæ* similia. Pedunculi 3–5 lin. longi.

The four preceding species are certainly very closely connected; but their geographical stations are too far separated to admit of our neglecting the minor characters which appear to distinguish them. Although each species is said to be abundant in its station, they are mostly known only from single gatherings. Future collections may possibly show variability in the pod and in the size and proportion of the other parts sufficient to justify the reunion of at least the southern forms.

205. M. QUITENSIS, *Benth.! in Hook. Journ. Bot.* iv. 408. Fruticosa, minute puberula. Pinnæ 6–12-jugæ; foliola 12–20-juga, linearia, acuta, ½–1 lin. longa. Capitula pedunculata, axillaria v. summa racemosa. Legumen subsessile, 1½-pollicare, 4 lin. latum, glabrum, nudum, valvis reticulatis indivisis.

Hab. Tropical America. Ravines round Quito, *Hall.* It is also, from *Bonpland*, in the Paris Herbarium, but without any station recorded; and I do not recognize it in any of the species described by Willdenow or by Kunth.

Although allied in essential characters to the four preceding species, this one is at once distinguished by the more numerous pinnæ and small leaflets. The flowers also are larger.

***** *Aculei nonnulli v. omnes infrastipulares, gemini. Legumen sæpius margine aculeatum.*

† *Aculei infrastipulares recti v. incurvi, petiolares recurvi v. nulli.*

206. M. SORATENSIS, *Benth.*, sp. n. Fruticosa ? glabra v. vix minute puberula. Aculei

sæpius terni, infrastipulares et infrafoliaceus, validi, recti, petiolares nulli. Pinnæ 4–6-jugæ; foliola 15–20-juga, linearia, ad 3 lin. longa, costa marginali. Capitula pedunculata, axillaria. Legumen ignotum.

Hab. Tropical America: Bolivia near Sorata, *Maudon*, n. 757.

Ramuli validi, angulato-sulcati. Aculei 3–6 lin. longi. Foliorum petiolus communis 2–2-pollicaris, pinnæ 1½-pollicares. Foliola obtusiuscula, costa margini arcte approximata, nervo altero tenuissimo vix conspicuo. Pedunculi solitarii v. gemini, 1–1½-pollicares. Capitula globosa v. paullo longiora quam lata. Flores glabri. Calyx ½ lin., corolla 1½ lin. longa.

207. M. GRAHAMI, *A. Gray! Pl. Wright.* ii. 52. Fruticosa, decumbens, glabra. Aculei infrastipulares gemini, recti, sparsi, pauci, uti petiolares recurvi. Pinnæ 6–8-jugæ; foliola 10–15-juga, oblonga, 2–3 lin. longa, 2–3-nervia et pennivenia. Capitula axillaria, pedunculata. Legumen sessile, 1–1½-pollicare, 3 lin. latum, rectum, glabrum, margine aculeis raris armato v. nudo, valvis indivisis.

Hab. Subtropical North America: Mexican-Texan region, *Wright*, n. 1042, *Seemann.*

†† *Aculei infrastipulares recurvi, rarius rectiusculi nec incurvi, sparsi dum adsint petiolaresque recurvi.*

208. M. ACANTHOCARPA, *Benth.! in Hook. Journ. Bot.* iv. 409. Fruticosa, minute cano-puberula. Aculei infrastipulares gemini, petiolaresque recurvi. Pinnæ 8–15-jugæ; foliola 6–10-juga, oblongo-linearia, 1½–2½ lin. longa, obscure 1–2-nervia. Capitula pedunculata, axillaria. Legumen sessile, 1–1½ poll. longum, 2–3 lin. latum, curvum v. rectiusculum, puberulum, margine exteriore v. utroque aculeato, valvis indivisis.

Acacia acanthocarpa, Willd.! Enum. Hort. Berol. 1057; Reichb. Icon. Exot. t. 63.

Mimosa aculeaticarpa, Ort.! Dec. 134.

Acacia aculeaticarpa, Lag. Elench. Hort. Matrit. Nov. Gen. et Sp. 16.

Acacia brachyacantha, Willd.! Enum. Hort. Berol. 1055 (folia tantum).

Hab. Tropical and subtropical North America: Mexico, frequent, *Berlandier*, n. 661, *Emory's Expedition*, n. 301, 308, *and many others.* Long since grown also in some European botanic gardens under various names.

209. M. FLEXUOSA, *Benth.! in A. Gray, Pl. Wright.* i. 62. Fruticosa, minute pruinoso-puberula. Aculei infrastipulares gemini rectiusculi v. recurvi, petiolares recurvi. Pinnæ 6–8-jugæ; foliola 8–10-juga, oblonga, subimbricata, vix semilinea longiora, cano-puberula. Capitula brevissime pedunculata, axillaria. Flores parvi, cano-pubescentes. Legumen sessile, pollice paullo longius, vix 2 lin. latum, cano-puberulum, crassiusculum, margine aculeato, valvis indivisis.

Hab. Extratropical North America: Mexican-Texan region, *Wright*, n. 161, 1365; *Emory's Expedition*, n. 310.

210. M. BIUNCIFERA, *Benth.! Pl. Hartw.* 12 *et in Hook. Journ. Bot.* iv. 409. Fruticosa, puberula. Aculei infrastipulares gemini, recurvi, petiolares minuti v. 0. Pinnæ 4–6-jugæ; foliola 10–15-juga, oblongo-linearia, ½–1 lin. longa. Capitula pedunculata, axillaria. Flores cano-pubescentes. Legumen sessile, falcatum v. fere annulatum, vix 2 lin. latum, glabrum, sæpius sinuatum, margine nudum v. pauciaculeatum, valvis indivisis.

Hab. Tropical and subtropical North America: Mexican-Texan region, *Hartweg*, *Andrieux*, n. 399; *Wright*, n. 1039, and many others.

211. M. Lindheimeri, *A. Gray! Pl. Fendl.* ii. 181. Fruticosa, glabra v. minute puberula. Aculei infrastipulares gemini, recurvi, petiolares minuti v. 0. Pinnæ 4–6-jugæ; foliola 8–12-juga, oblonga, 1–1½ lin. longa. Capitula pedunculata, axillaria. Flores glabri. Legumen sessile, rectiusculum, glabrum, ad 3 lin. latum, margine aculeatum, valvis indivisis.

Hab. Extratropical North America: Mexican-Texan region, *Lindheimer*, n. 383; *Wright*, n. 1363, *and others.*

The three preceding species may possibly prove to be varieties only of *M. acanthocarpa*, with smaller leaves, fewer pinnæ, and a somewhat variable pod.

212. M. Galeottii, *Benth.! in Hook. Lond. Journ.* v. 92. Fruticosa, setis brevibus hispidissima. Aculei infrastipulares gemini, recurvi, petiolares perrari v. 0. Pinnæ 15–25-jugæ; foliola 15–20-juga, oblonga, lineam longa, glabra, ciliata. Capitula pedunculata, axillaria. Legumen sessile, pollicare, 3 lin. latum, glanduloso-puberulum, margine setoso-aculeatum, valvis indivisis.

Acacia hirta, Mart. et Gal.! in Bull. Acad. Brux. x. pars ii. 318.

Hab. Tropical America: Mexico, *Galeotti*, n. 3165.

This species is evidently nearly allied to *M. acanthocarpa*, although the setæ are exceptional, and might place it technically among the *Pachycarpæ*, from which, however, the prickles and the flat pod exclude it.

††† *Aculei infrastipulares minuti v.* 0, *petiolares* 0.

213. M. mollis, *Benth.! in Hook. Journ. Bot.* iv. 408. Fruticosa, molliter rufo-villosa. Pinnæ 4–5-jugæ; foliola 6–10-juga, oblonga, utrinque villosa, 2–3 lin. longa. Capitula pedunculata, ad nodos fasciculata. Flores villosi. Legumen ignotum.

Hab. Tropical America: Mexico, *Andrieux*, n. 400.

214. M. tenuiflora, *Benth.! in Hook. Lond. Journ.* v. 92. Fruticosa, glabra. Pinnæ 1–3-jugæ; foliola 6–8-juga, oblonga, obtusissima, ad 2 lin. longa, enervia. Capitula pedunculata, inferiora axillaria, summa racemosa. Flores glabri. Calyx minutus. Corolla tenuis, 1½ lin. longa. Legumen ignotum.

Hab. Tropical America: Mexico, *Coulter*, *Karwinski*.

Series 5. Ephedroideæ. *Fruticuli ramulis apice spinescentibus. Stipulæ minimæ, subspinescentes, sæpe deciduæ. Folia minima, paucifoliolata, rara v.* 0. *Capitula globosa. Flores* 4–5-*meri. Legumen lineare, planum, nudum, glabrum v. pubescens, nec setosum.*

215. M. Gilliesii, *Benth.! in Hook. Journ. Bot.* iv. 413. Puberula. Rami crassiusculi, angulato-striati. Folia rara; pinnæ 1-jugæ; foliola 2–4-juga, oblonga, vix lineam longa. Capitula ad nodos pedunculata. Legumen immaturum puberulum, subfalcatum.

Prosopis globosa, Gill.! in Hook. Bot. Misc. iii. 205.

Hab. Extratropical South America: Mendoza, *Gillies*; Patagonia, *Tweedie*.

216. M. ephedroides, *Benth.! in Hook. Journ. Bot.* iv. 413. Glabra. Rami striati,

teretes. Folia desunt. Capitula ad nodos sessilia. Legumen $1\frac{1}{2}$-$2\frac{1}{2}$-pollicare, 6 lin. latum, glabrum.

Prosopis ephedroides, Gill. ! in Hook. Bot. Misc. iii. 204.

Hab. Extratropical South America : prov. San Luis, *Gillies*, near San Juan, *Jameson*.

Series 6. Stipellares. *Frutices glabri canescentes v. tomentoso-pubescentes nec setosi, inermes v. aculeis sparsis armati. Folia sæpius brevia, pinnis pauci- rarius multijugis, foliolis parvis. Stipellæ ad basin pinnarum minimæ, orbiculatæ v. ovatæ, nec setaceæ. Capitula globosa, axillaria, v. summa racemosa, pedunculata. Flores 4-meri. Calyx parvus, non ciliatus. Legumen planum, glabrum, pubescens v. tuberculatum nec setosum nec margine aculeatum, valvis (an semper ?) a margine in integro secedentibus.*

217 ? M. AURICULATA, *Benth. in Herb. Par. et DC.* Glabra, inermis. Stipulæ amplæ, orbiculatæ. Pinnæ 1-jugæ; foliola 6–8-juga, ovato-oblonga, semipollicaria v. longiora. Capitula racemosa. Legumen subsessile, glabrum, 1–$1\frac{1}{2}$-pollicare, 3 lin. latum, valvis pluriarticulatis.

Hab. Tropical America : Santiago, prov. Chiquitos in Bolivia, *D'Orbigny*, n. 877.

Species nulli mihi cognitæ vere affinis, a *Stipellaribus* cæteris differt inflorescentia racemosa et legumine, sed cum nulla alia serie convenit. Frutex videtur. Specimina undique glaucescunt. Ramuli teretes. Stipulæ persistentes, semipollicares longioresque, latissimæ, amplexicaules, coriaceæ, lineis crebris tenuissimis striatæ. Foliorum petiolus communis $1\frac{1}{2}$-pollicaris, interdum uti pedunculi glandulis stipitatis scaber, cæterum glaberrimus. Pinnæ 2–4-pollicares, stipellis ad basin geminis parvis obovatis. Foliola obtusissima, 6–8 lin. longa, 3–4 lin. lata, basi valde obliqua, subcoriacea, basi plurinervia, utrinque glabra et glaucescentia. Ramulorum pars florifera aphylla v. foliis semiabortivis instructa. Pedunculi intra stipulas solitarii, sub-2-pollicares. Capitula globosa, ad 30-flora. Bracteæ minutæ. Flores glaberrimi " purpurascentes." Calyx parvus, truncatus. Corolla vix linea longior, 4-fida. Stamina 8. Leguminis articuli variant 3–8.

218. M. BIFURCA, *Benth. ! in Hook. Journ. Bot.* iv. 407. Inermis, glabra. Pinnæ dissite 2–3-jugæ; foliola 20–30-juga, oblique ovata, 1–2 lin. longa, nitidula. Legumen stipitatum, $\frac{3}{4}$-pollicare, glabrum, læve.—*Fl. Bras. Mim.*

Hab. Extratropical South America : South Brazil.

219. M. INTRICATA, *Benth. ! in Hook. Journ. Bot.* iv. 407. Ramosissima, glabra v. pube minuta conspersa. Aculei parvi, crebri, recurvi. Pinnæ 4–6-jugæ; foliola 8–15-juga, ovata, vix $\frac{1}{2}$ lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Extratropical South America : South Brazil.

220. M. LUCIDULA, *Benth. ! in Hook. Journ. Bot.* iv. 407. Ramosissima, glabra, inermis. Pinnæ 3–5-jugæ; foliola 8–12-juga, oblonga, $\frac{3}{4}$–1 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

M. kermesina, Otto et Dietr. ! Gærtn. Zeit. iii. 209 ex Walp. Rep. i. 883.

Hab. Extratropical South America : South Brazil.

221. M. IMPLEXA, *Benth. ! in Hook. Journ. Bot.* iv. 411. Ramosissima, minute glanduloso-scabriuscula, inermis. Pinnæ 1-jugæ; foliola 4–7-juga, oblongo-linearia, 1 lin.

longa. Legumen subsessile, subfalcatum, 6–9 lin. longum, 2 lin. latum, pube minuta canescens, valvis indivisis.—*Fl. Bras. Mim.*

Hab. Extratropical South America : South Brazil and Montevideo.

222. M. URAGUENSIS, *Hook. et Arn.! in Hook. Bot. Misc.* iii. 202. Ramosissima, subglabra. Aculei sparsi, recti. Pinnæ sub-2-jugæ ; foliola 8–12-juga, oblongo-linearia, 1–2 lin. longa. Legumen subsessile, $\frac{3}{4}$–1-pollicare, 2–$2\frac{1}{2}$ lin. latum, glabrum, valvis indivisis.—*Bot. Reg.* 1842, t. 33 ; *Lindl. et Paxt. Fl. Gard.* ii. f. 200 ; *Fl. Bras. Mim.*

Hab. Extratropical South America : along the river Uruguay.

223. M. CRUENTA, *Benth.! in Hook. Journ. Bot.* iv. 407. Canescenti-tomentosa. Aculei sparsi recurvi v. 0. Pinnæ 1–3-jugæ ; foliola 6–8-juga, oblonga, 1–2 lin. longa. Bracteæ corolla breviores. Legumen subsessile, $\frac{1}{2}$–$\frac{3}{4}$ poll. longum, 2 lin. latum, canescenti-pubescens v. glabratum, valvis indivisis.—*Fl. Bras. Mim.*

Hab. Extratropical South America : South Brazil and along the Uruguay.

224. M. BRACTEOLARIS, *Benth.! in Hook. Journ. Bot.* iv. 408. Molliter canescens, inermis. Pinnæ 1–2-jugæ ; foliola 3–5-juga, oblonga, 2–4 lin. longa, pubescentia. Bracteæ subulatæ, corollam superantes. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Extratropical South America : South Brazil.

225. M. TRACHYCARPA, *Benth.! in Hook. Journ. Bot.* iv. 407. Tenuiter canescens, et glanduloso-pubescens. Aculei sparsi, recurvi. Pinnæ 3–4-jugæ ; foliola 6–12-juga, oblonga, vix lineam longa. Bracteæ breves. Legumen subsessile, falcatum, 6–9 lin. longum, 2–$2\frac{1}{2}$ lin. latum, undique tuberculis conicis echinatum, valvis indivisis.—*Fl. Bras. Mim.*

Hab. Extratropical South America : South Brazil and Maldonado.

Series 7. Leptopoda. *Frutices ramosissimi v. diffusi, suffrutices, v. rarius herbæ, inermes, laxe pubescentes v. glabri nec setosi. Foliorum petiolus communis sæpius tenuis longiusculus, interdum phyllodineus ; pinnæ* 1- *v. plurijugæ, sæpius breves, interdum paucæ v.* 0. *Stipellæ* (*excepta* M. cordistipula) *obscuræ v. subulatæ. Foliola parva. Pedunculi tenues. Capitula globosa, axillaria v. summa breviter racemosa. Flores sæpius* 3-*meri* 6-*andri, rarius* 4-*meri* 8-*andri. Calyx parvus, non ciliatus. Legumen ubi notum planum, inerme, glabrum v. pubescens nec setosum, valvis a margine in integro solvendis v. tardius rarius facillime in articulos plures secedentibus.*

* *Pedunculus folio multo longior.*

226. M. CORDISTIPULA, *Benth.! in Hook. Journ. Bot.* iv. 411. Fruticosa, molliter pubescens. Pinnæ 3–5-jugæ ; stipellæ latiusculæ ; foliola 10–15-juga, oblonga, lineam longa. Flores 4-meri. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America : Brazil, prov. Bahia.

227. M. FRANCISCANA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, glabra v. pilosula. Pinnæ 3–4-jugæ ; foliola 6–10-juga, obovato-oblonga, ad 2 lin. longa. Flores 3-meri. Legumen sessile, $1\frac{1}{4}$-pollicare, 3 lin. latum, glabrum, valvis 4–6-articulatis.

Hab. Tropical America : Brazil, prov. Bahia.

228. M. MISERA, *Benth.! in Hook. Journ. Bot.* iv. 411. Suffruticosa, diffusa, pilosula. Pinnæ 2–4-jugæ; foliola 4–10-juga, obovato-oblonga, 1–2 lin. longa. Flores 3-meri. Legumen sessile, subpollicare, 2 lin. latum, minute tomentellum, valvis tardius pluriarticulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Piauhy.

229. M. LEPTANTHA, *Benth.! in Hook. Journ. Bot.* iv. 411. Suffruticosa, diffusa, pilosula et subglanduloso-puberula. Pinnæ 2–4-jugæ; foliola 3–5-juga, oblonga, vix lineam longa. Flores 3-meri. Legumen sessile, semipollicare, valvis indivisis? v. articulatis? —*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia.

** *Pedunculus folio brevior v. paullo longior.*

† *Pinnæ* 1-*jugæ. Flores* 3-*meri.*

230. M. FILIPES, *Mart.! Herb. Fl. Bras.* 132. Annua, tenuis, glabra. Petioli filiformes; foliola 4–6-juga, oblonga, 2–3 lin. longa. Legumen stipitatum, $\frac{3}{4}$-pollicare, $1\frac{1}{2}$ lin. latum, glabrum, valvis 6–8-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Piauhy.

231. M. SUBENERVIS, *Benth.! in Mart. Fl. Bras. Mim.* Suffruticosa? rigidula, glabra. Foliola 10–12-juga, obovata, crassiuscula, 3–4 lin. longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia.

†† *Pinnæ plurijugæ, petiolo communi breviores, foliolis tamen numero pinnis æqualibus pluribusve. Flores sæpius* 4-*meri.*

232. M. BURCHELLII, *Benth.! in Mart. Fl. Bras. Mim.* Glabra. Caules elongati, prostrati. Pinnæ 3–4-jugæ; foliola 6–10-juga, oblonga, 2–3 lin. longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Goyaz.

233. M. FILIFORMIS, *Benth.! in Mart. Fl. Bras. Mim.* Glabra. Caules elongati, prostrati. Pinnæ 2–3-jugæ; foliola 12–20-juga, linearia, $\frac{3}{4}$–$1\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Goyaz.

234. M. BREVIPINNA, *Benth.! in Mart. Fl. Bras. Mim.* Pilosula rigidule hispida et glanduloso-pubescens. Caules elongati, prostrati. Pinnæ 5–10-jugæ; foliola confertim 6–10-juga, oblonga, 1–$1\frac{1}{2}$ lin. longa, vix ciliata. Flores glabri. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Piauhy.

235. M. CAPILLIPES, *Benth.! in Mart. Fl. Bras. Mim.* Pilosula v. molliter villosa. Caules elongati, prostrati. Pinnæ 4–6-jugæ; foliola 6–10-juga, oblongo-linearia, $1\frac{1}{2}$–2 rarius 3 lin. longa, ciliata. Flores hispiduli. Legumen sessile $1\frac{1}{2}$-pollicare, 2 lin. latum, puberulum, valvis indivisis? v. demum articulatis?

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

††† *Pinnæ* 6- *v. multijugæ, breves, foliolis quam pinnæ paucioribus.*

236. M. GRACILIS, *Benth. ! in Hook. Journ. Bot.* iv. 411. Suffruticosa, gracilis, glabra v. pilosula. Pinnæ 6–10-jugæ; foliola 4–6-juga, obovato-oblonga, 1–1½ lin. longa, membranacea. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

237. M. BLANCHETII, *Benth. ! in Mart. Fl. Bras. Mim.* Suffruticosa, rigidula, glabra v. glanduloso-scabra. Pinnæ 10–30-jugæ; foliola 6–8-juga, obovata, imbricata, 1½–2 lin. longa, crassiuscula. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia.

†††† *Pinnæ ad apicem petioli subphyllodinei perpaucæ minimæ, v.* 0.

238. M. PAUCIFOLIA, *Benth. ! in Hook. Journ. Bot.* iv. 412. Suffruticosa, romosissima, erecta, glaberrima. Pinnæ ad apicem petioli filiformis elongati 2–3-jugæ; foliola sub-2-juga, obovata, vix 1 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

239. M. PHYLLODINEA, *Benth. ! in Hook. Journ. Bot.* iv. 412. Suffruticosa, suberecta, glaberrima. Petioli phyllodinei, compressi, anguste lineares, 3–5-pollicares, 1–2 lin. lati, pinnis 0 v. ad mucrones 2 reductis, rarius minimis 2-foliolatis. Flores 4-meri. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

240. ? M. EXTRANEA, *Benth.*, sp. n. Subglabra. Petioli phyllodinei, compressi, lineares, 3-nerves, 1½–2-pollicares, fere 2 lin. lati, pinnis 0. Flores 3-meri. Legumen ignotum.

Hab. Tropical America: San Domingo, communicated by *Jacquemont* to the Berlin herbarium.

Suffrutex v. frutex videtur, glaber v. pube minuta præsertim in pedunculo conspersus. Ramulus tenuis, foliosus, subramosus. Stipulæ desunt. Phyllodia obtusa, basi breviter in petiolum contracta, subcoriacea, costa media nervoque utrinque laterali prominentibus percursa. Pedunculi tenues, terminales v. oppositifolii, 1–1½ poll. longi, ebracteati. Capitula absque staminibus 2 lin. diametro. Bracteæ sub floribus minutæ. Calyx vix conspicuus. Corolla campanulata, lineam longa, membranacea, in flore examinato apice late et obtuse 3-fida, lobis more generis valvatis. Stamina 6, corolla duplo longiora. Antheræ majusculæ, eglandulosæ; pollen omnino *Mimosæ*. Ovarium subsessile, glabrum.

Although I have only seen a single small specimen of this plant in the Berlin Herbarium, in flower only, without the fruit, the flowers are so exactly those of a *Mimosa*, that I have ventured to describe it as such, though the inflorescence is somewhat different, and the phyllodineous foliage only to be compared with that of the Brazilian *M. phyllodinea*.

Series 8. Somniantes. *Frutices suffrutices v. herbæ, aculeati v. inermes, glabri hirsuti v. setosi, ramis sæpius tenuibus. Pinnæ* 2- *v. plurijugæ, petiolo seta v. squamula inter pinnas cujusve paris instructo. Capitula globosa, parva, axillaria v. ad apices ramorum racemosa. Calyx minutus. Corollæ uti bracteæ multistriatæ. Legumen inerme, glabrum setosum v. glanduloso-hispidum, nunc lineare valvis in articulos plures facile secedentibus, nunc brevius valvis indivisis.*

The series has a rather distinct habit, and is distinguished from the rest of the genus by the striata corolla.

* *Bracteæ breves, in capitulo juniore haud eminentes.*

241. M. SOMNIANS, *Humb. et Bonpl. ! in Willd. Spec.* iv. 1036. Fruticosa v. suffruticosa, glabra v. villosa. Aculei sparsi. Pinnæ 2- v. plurijugæ; foliola 15–30-juga, linearia, 1–2 lin. longa. Legumen stipitatum, glabrum, setosum v. glanduloso-hispidum, $1\frac{1}{2}$–3 poll. longum, 2–3 lin. latum, valvis 5–8-articulatis.—*Kunth ! Mim.* 20. t. 7. *Fl. Bras. Mim.*

M. palpitans, Humb. et Bonpl. ! in Willd. Spec. iv. 1036.
M. somniculosa, H., B. et K. ! Nov. Gen. et Sp. vi. 257.
M. acutiflora, Benth. ! in Hook. Journ. Bot. iv. 397.
M. podocarpa, Benth. ! l. c.; Wawra, Bot. Maxim. Reise, i. t. 34.
M. quadrijuga, Salzm. !; Benth. l. c. 398.
M. vialis, Benth. ! in Herb. Mus. Par.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Bahia, Goyaz, Para, etc. Guiana, New Granada, Panama.

242. M. VISCIDA, *Willd. Enum. Hort. Berol.* 1048, *ex char.* Fruticosa, inermis, glanduloso-viscosa. Pinnæ 2–4-jugæ; foliola 30–50-juga, linearia, vix 2 lin. longa. Legumen stipitatum, 2–$2\frac{1}{2}$-pollicare, vix 2 lin. latum, pilis glandulosis conspersum, valvis 10–12-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

243. M. LASIOCARPA, *Benth.! in Hook. Journ. Bot.* iv. 399. Fruticosa, inermis, rufo-hirsuta. Pinnæ 4–8-jugæ; foliola 20–40-juga, linearia, $1\frac{1}{2}$–3 lin. longa, piloso-pubescentia. Legumen breviter stipitatum, $1\frac{1}{2}$–3-pollicare, 2 lin. latum, ferrugineo-hirtum et breviter pubescens, valvis 8–12-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

244. M. LEPTOCAULIS, *Benth. ! in Hook. Journ. Bot.* iv. 398. Suffruticosa? inermis, glabra v. parce strigosa et glandulifera. Pinnæ 1–2-jugæ; foliola 20–25-juga, linearia, vix 2 lin. longa, glabra. Legumen stipitatum, glabrum, nitidum, 1–$1\frac{1}{2}$-pollicare, 2–$2\frac{1}{2}$ lin. latum, valvis 8–10-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

245. M. TRIJUGA, *Benth. ! in Hook. Journ. Bot.* iv. 398. Suffruticosa? inermis, glabra v. parce strigosa et glandulifera. Pinnæ 3–4-jugæ; foliola 30–50-juga, linearia, 1–2 lin. longa. Legumen longe stipitatum, glabrum, 2–$2\frac{1}{2}$-pollicare, vix 2 lin. latum, valvis 8–12-articulatis.

Hab. Tropical America: Brazil, prov. Goyaz. We have also a specimen from Panama, *Sutton Hayes*; and I have seen another from San Domingo, *Meyerhof in Herb. Berol.*, which I cannot distinguish from *M. trijuga.*

246. M. LÆVIGATA, *Benth. ! in Linnæa,* xxii. 530. Suffruticosa, inermis, glabra v. strigosa. Pinnæ 5–6-jugæ, 1–$1\frac{1}{2}$-pollicares; foliola multijuga, linearia, 2 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes, and Goyaz.

247. M. LEPTORHACHIS, *Benth. ! in Mart. Fl. Bras. Mim.* Fruticosa, inermis, gla-

berrima. Pinnæ 4–6-jugæ, vix 4 lin. longæ, petiolo filiformi; foliola 6–10-juga, oblongo-linearia, obtusissima, vix lineam longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Minas Geraes.

** *Bracteæ striatæ, corolla longiores, in capitulo juniore cum floribus imbricatæ et ultra alabastros prominentes.*

248. M. BIJUGA, *Benth.! in Hook. Journ. Bot.* iv. 398. Fruticosa v. suffruticosa, inermis v. rarius minute aculeolata, parce glanduloso-pilosa. Pinnæ 2–3-jugæ; foliola multijuga, linearia, 2–4 lin. longa. Legumen longe stipitatum, 1½–2-pollicare, 2 lin. latum, setulosum et glanduloso-pilosum, valvis 8–10-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Piauhy and Goyaz.

249. M. LUPULINA, *Benth.! in Hook. Journ. Bot.* iv. 399. Fruticosa, inermis, rufo-hirta. Pinnæ 6–10-jugæ; foliola 20–30-juga, linearia, glabra, 1–2 lin. longa. Legumen sessile, pollicare, 2 lin. latum, setosum, valvis pluriarticulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

250. M. BRACHYCARPA, *Benth.! in Hook. Journ. Bot.* iv. 410. Fruticosa, inermis, strigoso-hispida. Pinnæ 4–8-jugæ; foliola multijuga, linearia, ½–1½ lin. longa. Legumen sessile, obovato-oblongum, subsemipollicare, 2–2½ lin. latum, undique hispidum, valvis indivisis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

Series 9. Asperatæ. *Frutices suffrutices v. herbæ, aculeati v. rarius inermes, setosi hirsuti strigosi v. rarius glabrati. Pinnæ pluri- v. multijugæ, rarissime* 1*-jugæ, petiolo inter pinnas sæpissime setifero. Foliola parva, sæpius multijuga. Capitula globosa v. subglobosa, axillaria v. ad apices ramorum racemosa. Flores vulgo* 4*-meri* 8*-andri, hinc inde* 5*-meri, rarissime* 3*-meri. Calyx minutus. Corolla membranacea, non striata. Legumen lineare oblongum v. obovatum, planum, undique setosum strigosum hispidum v. glandulosum, rarissime glabrum, valvis in articulos solvendis.*

The setose, hispid, or rigidly strigose indumentum generally distinguishes the species of this series from all the preceding *Habbasiæ* except the *Somniantes*, of which they have not the striate corollas. Some of the subseries *Schrankioideæ* come near to a few of the *Rubicaules*, but may generally be distinguished by the seta between the pinnæ or other minor characters, besides the habit, which, like that of the *Eumimosæ Spicifloræ*, had induced the placing of several of them before the fruit was known in the genus *Schrankia*.

* *Capitula axillaria v. subracemosa. Legumen breve, latum,* 1–3*-articulatum* (DORMIENTES).

251. M. DORMIENS, *Humb. et Bonpl.! in Willd. Spec.* iv. 1035. Fruticosa, procumbens, substrigoso-hirsuta. Aculei recti, sparsi v. in petiolis oppositi. Pinnæ 3–6-jugæ; foliola 6–20-juga, linearia, 2–4 lin. longa. Legumen sessile, semipollicare, 4 lin. latum, apice oblique truncatum, hirsutum, articulis valde obliquis latioribus quam longis.—*Fl. Bras. Mim.*

M. humilis, Humb. et Bonpl.! in Willd. l. c. 1037.

M. intermedia, Kunth! Mim. 16, t. 6.

Hab. Tropical America: North Brazil, Guiana, Venezuela, New Granada, also in *Pavon's* collection, probably from Central America.

252. M. CAMPORUM, *Benth.! in Hook. Journ. Bot.* ii. 130, iv. 403. Annua (v. demum suffruticosa ?), procumbens, patentim hispida. Aculei minimi rari v. 0. Pinnæ 2–6-jugæ; foliola 10-, sæpius 20–30-juga, linearia, $1\frac{1}{2}$–3 lin. longa, glabriuscula. Pedunculi breves. Legumen sessile, 3–6 lin. longum, 2 lin. latum, hispidum, subæquale, articulis subquadratis.—*Fl. Bras. Mim.*

M. flaviseta, Benth.! in Hook. Lond. Journ. v. 90.

M. æschynomenis, Benth.! Bot. Sulph. 89 (legumine minore).

M. flavescens, Splitg.! Pl. Nov. Surin. 16 (in Hoev. et Vr. Tijdschr. ix.).

Hab. Tropical America: North Brazil, Surinam, British Guiana, Central America.

253. M. PUSILLA, *Benth.! Bot. Sulph.* 90. Annua, tenella, inermis, hispidula. Pinnæ 1–3-jugæ; foliola 6–15-juga, oblonga, 2–3 lin. longa, ciliata. Pedunculi breves. Capitula parva, pauciflora. Legumen parvum, oblongum, undique setosum.

Hab. Tropical America: Realejo, *Hinds.* Possibly a small slender variety of *M. camporum.*

254. M. STRIGILLOSA, *Torr. et Gr.! Fl. N. Amer.* i. 399. Perennis, prostrata, strigoso-setosa vix demum glabrescens. Aculei parvi rari v. 0. Pinnæ 4–6-jugæ; foliola 10–15-juga, oblongo-linearia, $1\frac{1}{2}$–3 lin. longa. Pedunculi elongati. Legumen 8–10 lin. longum, 3 lin. latum, undique setosum, articulis subquadratis.

Hab. Extratropical and subtropical North America: Southern United States and Mexican region.

** *Capitula axillaria v. racemosa brevipedunculata. Caules elongati, ad angulos aculeatissimi* (SCHRANKIOIDEÆ).

255. M. INVISA, *Mart.! Herb. Fl. Bras.* 121. Laxe ramosa v. subscandens, laxe pilosula. Aculei crebri, recurvi. Pinnæ 4–8-jugæ; foliola multijuga, oblongo-linearia, ad 2 lin. longa. Pedunculi axillares, brevissimi. Legumen $\frac{1}{2}$–1-pollicare, 2–3 lin. latum, margine aculeolatum, valvis sparse setosis tardius 4–5-articulatis.—*Fl. Bras. Mim.*

Schrankia brachycarpa, Benth.! in Hook. Journ. Bot. ii. 130; iv. 415.

Mimosa diplotricha, Wright! in Sauv. Pl. Cub. 34.

Hab. Tropical America: Brazil, common in prov. Sao Paulo, Rio Janeiro, Minas Geraes, and Goyaz, also in North Brazil, Guiana, West Indies, Panama, Mexico.

Mimosa longisiliqua, Lam. Dict. i. 21, was founded on Breynius's description and figure, Cent. Pl. Exot. t. 17, which gives an excellent representation of a flowering branch of *M. invisa,* to which has been unfortunately added a loose bunch of fruits of *M. asperata.*

256. M. SELLOI, *Benth.! in Mart. Fl. Bras. Mim.* Subscandens, glabra. Aculei minimi, crebri, recurvi. Pinnæ 2–3-jugæ; foliola 10–20-juga, linearia, 2–3 lin. longa, glabra. Pedunculi $\frac{1}{2}$–1-pollicares. Legumen subsessile, $1\frac{1}{2}$-pollicare, 3 lin. latum, margine crebriaculeolatum, valvis glabris nudis 8–10-articulatis.

Schrankia Selloi, Benth.! in Hook. Journ. Bot. iv. 415.

Hab. Tropical and subtropical South America: Brazil, prov. Rio Janeiro and Sao Paulo.

257. M. ERVENDBERGII, *A. Gray! in Proc. Amer. Acad.* v. 178. Subscandens, villosa. Aculei parvi, crebri, recurvi. Pinnæ 4–6- (sæpius 5-)jugæ; foliola 10–20-juga, oblongo-linearia, 2–4 lin. longa, utrinque appresse pubescentia. Capitula breviter pedunculata, ad apices ramorum racemosa.

Schrankia elata, Mart. et Gal. in Bull. Acad. Brux. x. pars ii. 307, ex char.

Hab. Tropical America: Mexico, *Ervendberg*, and, if rightly referred to this species, *Galeotti*, n. 3193.

*** *Capitula pleraque racemosa. Indumentum glandulosum. Legumen lineare* (GLANDULOSÆ).

† *Capitula parva, glabra, bracteis parvis.*

258. M. ADENOCARPA, *Benth.! in Hook. Journ. Bot.* iv. 399. Fruticosa, glanduloso-hirta. Aculei sparsi, recurvi. Pinnæ 6–10-jugæ; foliola 10–20-juga, linearia, $1\frac{1}{2}$–2 lin. longa. Legumen subsessile, $\frac{3}{4}$–1 poll. longum, $1\frac{1}{2}$ lin. latum, rostratum, glanduloso-villosum, valvis 4–6-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Bahia.

259. M. ORTHOCARPA, *Spruce*; *Benth.! in Mart. Fl. Bras. Mim.* Herbacea, glanduloso-pubescens. Aculei sparsi, tenues, recti. Pinnæ 6–10-jugæ; foliola 10–20-juga, linearia, $1\frac{1}{2}$–2 lin. longa. Legumen stipitatum, $\frac{3}{4}$–1 poll. longum, 2–$2\frac{1}{2}$ lin. latum, glanduloso-pilosum, erostre, valvis pluriarticulatis.—*Fl. Bras. Mim.*

M. glandulosa, Bong.! in Herb. Mus. Petrop. non aliorum.

Hab. Tropical America: Brazil, prov. Para.

†† *Capitula bractearum ciliis eminentibus hispida v. comosa.*

260. M. PALUDOSA, *Benth.! in Hook. Journ. Bot.* iv. 400. Fruticosa, longe setoso-hispida et glanduloso-villosa. Aculei sparsi, recti v. subincurvi. Pinnæ 6–15-jugæ; foliola 20–40-juga, linearia, $1\frac{1}{2}$–3 lin. longa, hispidula. Calyx truncatus. Legumen sessile, 2–3-pollicare, 4 lin. latum., viscoso-pubescens, valvis pluriarticulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Piauhy, Minas Geraes, and Goyaz.

261. M. MELANOCARPA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, scabro-viscida et hispida, inermis. Pinnæ 8–12-jugæ; foliola 20–50-juga, linearia, 1–2, rarius 3 lin. longa, sordide viscido-puberula. Calyx pappiformis. Legumen breviter stipitatum, $1\frac{1}{2}$–3-pollicare, 3–4 lin. latum, viscoso-pubescens, valvis pluriarticulatis.

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes and Goyaz.

**** *Capitula axillaria v. summa breviter racemosa. Indumentum non glandulosum. Setæ inter pinnas sæpius longæ. Legumen elongatum, sæpe latiusculum* (ASPERATÆ VERÆ).

262. M. ASPERATA, *Linn.! Spec.* 1507. Fruticosa, setoso-hispida v. strigosa. Aculei sparsi, recurvi v. subrecti. Pinnæ 8–15-jugæ; foliola multijuga, linearia, 2–3 lin. longa, subtus pubescentia v. hirta. Capitula globosa. Legumen $1\frac{1}{2}$–3-pollicare, 5–6 lin. latum,

longe v. breviter setoso-hirsutissimum, valvis late breviterque multiarticulatis.—*Fl. Bras. Mim.*; *Oliv. Fl. Trop. Afr.* ii. 335.; *DC.! Mém. Lég.* t. 63.

M. pigra, Linn. l. c.

M. polyacantha, Willd. Spec. iv. 1034.

M. hispida, Willd. l. c. 1037.

M. canescens, Willd. l. c. 1038.

M. pellita, Humb. et Bonpl. ! in Willd. l. c. 1037; Kunth, Mim. 27, t. 9.

M. ciliata, Willd. ! Enum. Hort. Berol. 1048.

M. sicaria, Hoffmans. Verz. ex DC. Prod. ii. 428.

M. bellatrix, Hoffmans. Verz. ex Steud. Nom. Bot. ed. 2.

M. Habbas, Delile, Fl. Eg. Illustr. 31; Cent. Pl. Afr. Caill. 24.

M. procumbens, Schum. et Thonn. Beskr. Pl. Guin. 324.

Hab. Throughout tropical America, and widely spread over tropical and subtropical Africa and the Mascarene islands. Occurs also in East-Indian collections, but probably only from botanic gardens.

263. M. ELLIPTICA, *Benth.! in Hook. Journ. Bot.* iv. 400. Fruticosa, sparse setoso-hispida. Aculei sparsi, recti v. recurvi. Pinnæ 7–10-jugæ; foliola multijuga, linearia, 2–3 lin. longa, vix pilosula. Capitula oblongo-elliptica. Legumen 1–1½-pollicare, 4–5 lin. latum, parce v. copiose setosum, valvis late breviterque multiarticulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

264. M. CINEREA, *Vell. Fl. Flum. Ic.* xi. t. 35. Fruticosa, procumbens v. subscandens, appresse strigosa. Aculei parvi, subrecurvi. Pinnæ 6–10-jugæ; foliola 20–30-juga, linearia, 2–3 rarius 4 lin. longa, glabra, ciliata. Capitula globosa. Legumen 1–2-pollicare, 4–5 lin. latum, brevissime appresseque setosum, valvis 4–10-articulatis.—*Fl. Bras. Mim.*

Hab. Tropical and subtropical South America: Brazil, prov. Rio Janeiro and southern provinces, common along the Uruguay.

This and the preceding species are certainly very near to *M. asperata,* but appear to me to constitute forms of limited geographical range, and there maintaining distinctive characters sufficient to entitle them to rank as species.

Var.? *pubescens.* Frutex pube molli canescens, strigis paucis intermixtis.—Brazil, prov. Goyaz. Possibly a distinct species, or, on the other hand, reducible to a variety of *M. asperata,* but as yet only known from Burchell's specimen.

265. M. WEDDELLIANA, *Benth. ! in Mart. Fl. Bras. Mim.* Fruticosa, strigosa. Aculei sparsi, rari. Pinnæ unijugæ; foliola multijuga, oblonga, 3–4 lin. longa, subtus parallele 7–11-venosa, ciliata, glabra. Capitula globosa. Legumen sub-2-pollicare, 5–6 lin. latum, strigosum, breviter lateque multiarticulatum.

Hab. Tropical America: Brazil, prov. Mattogrosso.

***** *Capitula minima, racemoso-subpaniculata* (MICROCEPHALÆ).

266. M. MICROCEPHALA, *Humb. et Bonpl.! in Willd. Spec.* iv. 1039. Fruticosa, ramosissima, hispidula, habitu *Calliandræ parvifloræ,* inermis. Pinnæ 20–30-jugæ; foliola 20–30-juga, linea sæpius breviora, glabra v. ciliolata. Capitula vix 2 lin. diametro,

pedunculis filiformibus. Legumen 1–2-pollicare, 1½–2 lin. latum, strigoso-pilosum, valvis 6–8-articulatis.—*Kunth ! Mim.* 23, t. 8; *Fl. Bras. Mim.*

Hab. Tropical America: North Brazil, Guiana, and Venezuela.

Series 10. Adversæ. *Frutices v. suffrutices pilosi, aculeis sursum incurvis nec recurvis armati. Pinnæ pluri- v. multijugæ. Foliola multijuga, parvula. Capitula globosa, racemosa. Bracteæ et calyces setoso-ciliati. Legumen setosum nec aculeatum, valvis indivisis a margine in integro solvendis.*

267. M. ADVERSA, *Benth. ! in Mart. Fl. Bras. Mim.* Fruticosa? adpresse pilosa. Aculei sparsi. Pinnæ 10–15-jugæ; foliola 30–50-juga, linearia, 1½–2½ lin. longa, glabra v. puberula. Legumen stipitatum, 2–2½-pollicare, ad 4 lin. latum, planum, appresse breviterque setosum.—*Fl. Bras. Mim.*

M. antrorsa, Benth.! in Hook. Journ. Bot. iv. 403 (nomen vitiosum).

Hab. Tropical America: Brazil, prov. Minas Geraes.

268. M. ADENOTRICHA, *Benth. ! in Hook. Lond. Journ.* v. 91. Suffruticosa v. fruticosa, glanduloso-hirta et pubescens. Aculei parvi, sparsi. Pinnæ 6–8-jugæ; foliola 10–15-juga, oblongo-linearia, ad 2 lin. longa, subtus hispida. Legumen breve, adpresse setosum. —*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

Series 11. Pachycarpæ. *Frutices suffruticesve inermes, setosi. Folia non sensitiva. Pinnæ pluri-, sæpius multijugæ. Foliola multijuga, coriacea, sæpius nitida. Capitula globosa, sæpius majuscula, ad apices ramorum conferta v. racemosa. Flores 4-meri, 8-andri. Bracteæ et calyces setoso-ciliati. Legumen ubi notum breve, crassiusculum, setosum v. hispidum, valvis indivisis, a margine sæpe lato in integro solvendis.*

* *Pinnæ pauci-* (2–6-)*jugæ.*

269. M. NITENS, *Benth. ! in Hook. Journ. Bot.* iv. 404. Fruticosa, patentim setosa. Pinnæ 2–3-jugæ; foliola multijuga, late linearia, 3–6 lin. longa, nitida. Capitula paniculata. Legumen breviter stipitatum, 1–1½-pollicare, 4 lin. latum, crassiusculum, setosum v. hispidum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

270. M. VERNICOSA, *Bong.; Benth. ! in Hook. Journ. Bot.* iv. 404. Fruticosa, parce strigosa. Pinnæ 4–6-jugæ; foliola multijuga, linearia, 3–6 lin. longa, nitida, glabra. Legumen sessile, 1½–2-pollicare, 8–9 lin. latum, crassum, appresse setosum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

** *Pinnæ multi-* (8–30-)*jugæ. Racemus elongatus. Corollæ glabræ.*

271. M. LEIOCEPHALA, *Benth. ! in Hook. Journ. Bot.* iv. 404. Fruticosa, strigosa. Pinnæ 10–15-jugæ; foliola multijuga, linearia, 2–2½ lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

272. M. SETOSA, *Benth.! in Hook. Journ. Bot.* iv. 404. Fruticosa, patentim setosa. Pinnæ 15–25-jugæ; foliola multijuga, linearia, 1½–2 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

*** *Pinnæ multi-* (8–30-)*jugæ. Racemus elongatus. Corollæ hirsutæ.*

273. M. RIEDELI, *Benth.! in Hook. Lond. Journ.* v. 91. Fruticosa, dense scabro-pubescens. Pinnæ 15–20-jugæ; foliola multijuga, ovata v. oblonga, ad 2 lin. longa. Racemus subramosus, dense setosus. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

274. M. GARDNERI, *Benth.! in Hook. Journ. Bot.* iv. 405. Fruticosa (v. suffruticosa?), hispidissima. Pinnæ 15–30-jugæ, rarius foliorum inferiorum 5–6-jugæ; foliola multijuga, linearia, 2–3 lin. longa, ciliata, cæterum glabra. Capitula 7–8 lin. diametro, hirsutissima. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

275. M. MULTIPINNA, *Benth.! in Mart. Fl. Bras. Mim.* Fruticosa, strigoso-setosa. Pinnæ 8–20-jugæ; foliola multijuga, linearia, 2–3 lin. longa, ciliolata. Capitula 5–6 lin. diametro, breviter hirsuta. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Goyaz.

276. M. FOLIOLOSA, *Benth.! in Hook. Journ. Bot.* iv. 406. Fruticosa, breviter denseque hirsuta. Pinnæ 20–35-jugæ; foliola multijuga, oblonga, ad 1 lin. longa, hirsuta. Capitula 3–5 lin. diametro. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

The three preceding species are certainly nearly allied to each other; but I have now seen a considerable number of specimens of each, which all appear to maintain their distinctive character.

**** *Pinnæ multi-* (10–30-)*jugæ. Capitula axillaria v. ad apices ramorum conferta, brevipedunculata.*

277. M. CLAUSSENI, *Benth.! in Hook. Journ. Bot.* iv. 405. Fruticosa, ramis crassis densissime echinato-setosis. Pinnæ 2-pollicares longioresque; foliola multijuga, linearia, 3–5 lin. longa, subglabra. Legumen sessile, crassum, 1–1½-pollicare, ½ poll. latum, dense setosum, margine lato, valvis indivisis.—*Fl. Bras. Mim.*

M. pycnocoma, Benth.! l. c.

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz; apparently very common.

278. M. DENSA, *Benth.! in Hook. Journ. Bot.* iv. 405. Fruticosa, setis brevibus strigosa v. scabro-hirta. Pinnæ infrapollicares; foliola multijuga, oblongo-linearia, 1–1½ lin. longa, pubescentia v. hirta. Legumen sessile, crassum, scabro-hirtum, 1–1½-pollicare, 6–8 lin. latum, margine latissimo, valvis indivisis.—*Fl. Bras. Mim.*

M. platyloma, Benth.! l. c. 406.

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

279? M. PACHYCARPA, *Benth.! in Hook. Journ. Bot.* iv. 406. Fruticosa, scabro-

pubescens et strigosa. Pinnæ infrapollicares; foliola multijuga, linearia, 2–3 lin. longa, glabra. Legumen sessile, crassum, oblongum, verrucosum, margine lato, valvis indivisis. —*Fl. Bras. Mim.*

Hab. Tropical America: South Brazil, *Sello.*

This species may require further confirmation. I described it formerly from a single fruiting specimen in the Berlin Herbarium. The only specimen in the collection now lent me from thence, has neither flowers nor fruit.

XVIII. Schrankia, Willd.

Benth. et Hook. Gen. Pl. i. 593, excl. Sect. *Rhodostachya.*

The genus is now limited to the capitate species with diplomerous stamens. The spicate 5-androus species prove to be true *Mimosæ.*

* *Species Austro-Americanæ, pedunculis* 1–3 *lin. longis.*

1. S. leptocarpa, *DC.! Prod.* ii. 443. Pinnæ 2–3-jugæ; foliola 10–20-juga, 3–6 lin. longa, venis vix conspicuis. Legumen tenue, 3–4-pollicare, longe rostratum, aculeis in marginibus 2-seriatis, in valvis 1–2-seriatis.—*Fl. Bras. Mim.*; *Oliv.! Fl. Trop. Afr.* ii. 336.

Hab. Tropical America: common in Brazil; also in Guiana and Columbia. Found also in Tropical Africa and Java, but probably introduced.

2. S. hamata, *Humb. et Bonpl. in Willd. Spec.* iv. 1042. Pinnæ 4–5-jugæ; foliola multijuga, 3 lin. longa, crassiuscula, venis impressis. Legumen 3-pollicare, rostratum, undique dense longeque setoso-aculeatum.

Mimosa tetragona, Poir. Dict. Suppl. i. 56.

Hab. Tropical America: On the Magdalena, *Humboldt and Bonpland*; La Paila, *Holton.*

I have not seen the typical specimen; there is none in the Parisian set of Humboldt's plants, and Kunth had not seen it; but the one of Holton's in the Hookerian Herbarium answers precisely to Willdenow's character, both as to the prickles of the pod and the impressed veins of the leaflets, which are both exceptional in the genus.

** *Species Americæ borealis v. centralis, pedunculis semipollicem et sæpius pollicem excedentibus.*

3. S. aculeata, *Willd. Spec.* iv. 1041. Aculei sæpius distantes, recurvi. Pinnæ 2–3-jugæ; foliola 8–15-juga, 2–3 lin. longa, obscure venosa. Pedunculi subpollicares. Legumen breviter acuminatum, 2–3-pollicare, aculeis pluriseriatis sæpius brevibus.

Mimosa quadrivalvis, Linn. Spec. 1508.

Hab. Tropical America: near Vera Cruz, in Mexico, *Schiede, Ferd. Mueller.*

Var.? Aculeis in legumine paucis brevibus.—Texas or Mexico, *Berlandier,* n. 2513.

4. S. uncinata, *Willd. Spec.* iv. 1043. Aculei crebri. Pinnæ 4–6-jugæ; foliola multijuga, $1\frac{1}{2}$–3 lin. longa, subtus v. utrinque elevato-venosa. Pedunculi 2–3-pollicares. Legumen acutum v. breviter acuminatum, 2–3-pollicare, undique dense aculeatum.—*Torr. et Gr. Fl. N. Amer.* i. 400.

Mimosa horridula, Mich. ! Fl. Bor. Amer. ii. 254 (including *S. angustata*) ; Vent. Choix, t. 28.
Mimosa Intsia, Walt. Fl. Carol. 252, non Linn.
Mimosa microphylla, Sm. ex Steud. Nom. Bot. ed. 2.
Leptoglottis Nuttallii, DC. ! Mém. Lég. 451.
Hab. Extratropical North America : Southern United States.
Var. pinnis parvis, 2–3-jugis.—Monterey, Texas, *Eaton and Edwards*.

5. S. ANGUSTATA, *Torr. et Gr. ! Fl. N. Amer.* i. 400. Aculei parvi. Pinnæ 4–6-jugæ ; foliola multijuga, 1–2 lin. longa, venis obscuris. Pedunculi 1–2-pollicares. Legumen tenue, subulato-rostratum, 4-6-pollicare, aculeis parvis seriatis.
Hab. Extratropical North America : Southern United States.
Some specimens from Florida, *Ruegel*, n. 210, have the small leaflets and long slender subulate-acuminate pod of *S. angustata* ; but the leaflets have the raised veins of *S. uncinata*. It would seem, therefore, to require further observation to ascertain how far the venation of the leaflets (very fine and obscure in *S. leptocarpa*, *aculeata* and *angustata*, very prominent in *S. uncinata*, and rather deeply sunk in *S. hamata*) is really available as a constant specific character.

6. S. PLATYCARPA, *A. Gray* ! *Pl. Lindh.* ii. 183. Pinnæ 3–4-jugæ ; foliola 8–12-juga, 2–3 lin. longa, tenuiter v. obscure venosa. Pedunculi subpollicares. Legumen sub-2-pollicare, compressum, 3 lin. latum, puberulum, breviter et crebre aculeatum.
Mimosa Rœmeriana, Scheele, in Linnæa, xxi. 456.
Hab. Extratropical North America : Texas, *Lindheimer*.

This species closely connects *Schrankia* with *Mimosa*, the pod having the same structure as that of the *Habbasiæ Pachycarpæ*, although of a much thinner consistence. But all the true *Mimosæ* with the *Schrankia* habit have a typical articulate pod ; and the present species is thus much better placed in *Schrankia* than in *Mimosa*.

XIX. LEUCÆNA, Benth.

Benth. et Hook. Gen. Pl. i. 594.

The species of this genus had been universally placed in *Acacia* on account of the pod, which certainly resembles that of many species of that genus. But the separation, founded on the marked difference in the stamens, is further confirmed on a closer examination of the fruit, which is really nearer to that of *Desmanthus* than of *Acacia*, as well in the consistence of the valves as in the shape and especially in the albumen of the seeds, differing from that of *Desmanthus* chiefly in the greater breadth.

* *Foliola multijuga, parva, linearia.*

1. L. FORSTERI, *Benth. ! in Hook. Lond. Journ.* v. 94. Ramuli teretiusculi. Stipulæ setiformes, persistentes. Pinnæ 10–15-jugæ ; glandula petiolaris parva ; foliola 20–40-juga, oblongo-linearia, 2–3 lin. longa. Corolla calyce parum v. dimidio longior. Legumen breviter stipitatum, $1\frac{1}{2}$–3-pollicare, 5–6 lin. latum, glabrum, valvis reticulato-venosis.
Mimosa glandulosa, Forst. ! Prod. 92.
Acacia glandulosa, Guillem. ! in Ann. Sc. Nat. ser. 2. vii. 360.
Hab. Islands of the Pacific, from New Caledonia to Tahiti.

2. L. ESCULENTA, *Benth.* Ramuli petiolique acutanguli. Stipulæ obsoletæ. Pinnæ 20–40-jugæ ; glandula petiolaris magna, oblonga ; foliola ultra 50-juga, linearia, $2\frac{1}{2}$–$3\frac{1}{2}$ lin. longa. Corolla calyce subduplo longior. Legumen planum, glabrum, basi longe attenuatum.

Acacia esculenta, Moc. et Sess. in DC. Prod. ii. 470.

Mimosa esculenta, Herb. Pavon. !

Hab. Tropical America: Mexico, *Uhde* (*Herb. Berol.*); New Spain, *Herb. Pavon.*

Ramuli crassi, lineis elevatis a quoque folio decurrentibus angulati v. angustissime alati, uti folia oculo armato minutissime puberuli apparent, vix demum glabrati. Foliorum petiolus communis 6–10-pollicaris, acute 3-angulatus, glandula prope basin magna oblonga. Pinnæ 2½–3-pollicares. Foliola anguste linearia, fere dimidiata, costa submarginali. Pedunculi crassi, ½–1-pollicares, fasciculati, in racemum brevem terminalem dispositi. Capitula globosa, dense multiflora, absque staminibus semipollicem diametro. Bracteæ minimæ. Flores sessiles v. subsessiles, glabri. Calyx fere 1½ lin. longus, campanulatus, membranaceus, lobis 5 brevibus rotundatis, æstivatione aperta vix valvata. Corolla 2–2½ longa, petalis a basi solutis lineari-spathulatis æstivatione valvatis. Stamina 10, corolla dimidio longiora. Antheræ majusculæ, glabræ. Ovarium glabrum.

3. L. DIVERSIFOLIA, *Benth. ! in Hook. Journ. Bot.* iv. 417. Ramuli subteretes. Stipulæ parvæ. Pinnæ 4–17-jugæ; glandula petiolaris magna; foliola 20–60-juga, linearia, 2–3 lin. longa. Flores glabri. Corolla calyce duplo longior. Legumen stipitatum, 3–4-pollicare, 6–7 lin. latum, glabrum, nitidulum.

Acacia diversifolia, Schlecht. ! in Linnæa, xii. 570.

Acacia trichandra, Zucc. ! Pl. Nov. ii. 41 (Abhandl. Akad. Wiss. München, ii. 349).

Hab. Tropical America: Mexico, *Herb. Pavon.*, *Schiede*, and many others.

4. L. PULVERULENTA, *Benth. ! in Hook. Journ. Bot.* iv. 417. Ramuli striati, pulveraceo-tomentelli. Stipulæ minimæ. Pinnæ 15–18-jugæ; glandula petiolaris oblonga; foliola fere 60-juga, linearia, 2–2½ lin. longa. Flores tomentosi. Corolla calyce subquadruplo longior. Legumen stipitatum, semipedale, 7–9 lin. latum, glabrum, nitidulum.

Acacia pulverulenta, Schlecht. ! in Linnæa, xii. 571.

Acacia esculenta, Mart. et Gal. ! in Bull. Acad. Brux. x. pars ii. 312.

Hab. Tropical America: Mexico, *Schiede, Galeotti, Berlandier*; and also a very young specimen in Herb. Linn. appears to be this species.

5. L. GLAUCA, *Benth. ! in Hook. Journ. Bot.* iv. 416. Ramuli subteretes, minute tomentelli v. glabrati. Stipulæ parvæ, caducæ. Pinnæ 4–8-jugæ; foliola 10–20-juga, linearia, 4–6 lin. longa. Flores cano-puberuli. Corolla calyce duplo longior. Legumen breviter stipitatum, 4–6-pollicare, 4–6 lin. latum, glabrum.

Mimosa glauca, Linn. Spec. 1504.

Acacia glauca, Willd. Spec. iv. 1075.

Mimosa leucocephala, Lam. ! Diet. i. 12.

Acacia leucocephala, Link. Enum. Hort. Berol. ii. 444.

Acacia biceps, Willd. ! Spec. iv. 1075.

Mimosa biceps, Poir. Dict. Suppl. i. 75.

Acacia frondosa, Willd. Spec. iv. 1076.

Mimosa frondosa, Klein, in Poir. Dict. Suppl. i. 76.

Hab. Common in the warmer regions both of the New and the Old World, but in most cases planted or introduced; most probably of North American origin.

** *Foliola paucijuga, majora, latiuscula.*

6. L. RETUSA, *Benth. ! in A. Gray, Pl. Wright.* i. 64. Subglabra. Pinnæ 2–5-jugæ; foliola 6–8-juga, oblique obovata v. late oblonga, acutiuscula obtusa v. retusa, 6–10 lin.

longa, membranacea, venosa. Pedunculi 1–2-pollicares. Antheræ glabræ. Legumen 6–9-pollicare, semipollicem latum, valvis rigidulis venosis.

Acacia Sabiana, Buckl. in Proc. Acad. Philad. 1861, 453; 1862, 163.

Hab. Extratropical North America: Mexican-Texan region, *Wright*, n. 71, *Emory's Expedition*, n. 318.

7. L. TRICHODES, *Benth. ! in Hook. Journ. Bot.* iv. 417. Subglabra. Pinnæ 2–3-jugæ. Foliola 2–5-juga, ovata, obtusa, ½–1-pollicaria v. rarius 1–2-pollicaria, pennivenia. Pedunculi vix ½-pollicares. Antheræ pilosæ. Legumen tenue, 4–8 poll. longum, 6–9 lin. latum.

Mimosa trichodes, Jacq. Hort. Schœnbr. iii. 76, t. 394.

Acacia trichodes, Willd. Spec. iv. 1063.

Acacia pseudotrichodes, DC.! Prod. ii. 466.

Hab. Tropical America: San Domingo, Venezuela, Peru.

8. L. MACROPHYLLA, *Benth. Bot. Sulph.* 90, *and in Hook. Lond. Journ.* v. 95. Glabra. Pinnæ 2–3-jugæ; foliola 2–4-juga, ovata, acuminata v. acuta, 1–2-pollicaria, pennivenia et reticulato-venosa. Pedunculi 2–4 lin. longi, in racemos axillares terminalesque dispositi. Antheræ pilosæ. Legumen stipitatum, 2–6-pollicare, ½–1 poll. latum, membranaceum, glabrum.

Hab. Tropical America: Panama, Acapulco, and (apparently the same) Cape St. Lucas, California, *Xantus*.

9. L. CANESCENS, *Benth.! Pl. Hartw.* 117, *et in Hook. Lond. Journ.* v. 94. Pube brevi canescens. Pinnæ 1–2-jugæ; foliola 2–4-juga, ovata, obtusa, 1–2-pollicaria, pennivenia, venulis vix conspicuis. Pedunculi subpollicares. Antheræ pilosæ. Legumen stipitatum, semipedale, ¾–1 poll. latum, puberulum v. demum glabrescens.

Hab. Tropical America: Guayaquil, *Herb. Pavon.*, *Hartweg*, *Spruce*.

XX. ACACIA, Willd.

Benth. et Hook. Gen. Pl. 594.

This genus, which still appears to me to be naturally as well as definitely characterized by the stamens, neglecting the various forms assumed by the pod in ripening, remains the largest among Mimoseæ, and, next to *Astragalus*, the largest among Leguminosæ. I have not either been able, in this my third careful revision of the species, to divide it into sections founded upon any character derived from the flowers or fruits; I therefore here repeat the series, based upon habit inflorescence and geographical distribution, which are given in the 'Genera Plantarum,' subdividing them into subseries and minor groups still less definitely limited, but of which the following may be taken as the chief characters, neglecting minor exceptions.

Series 1. PHYLLODINEÆ. *Folia ad phyllodia teretia v. verticaliter compressa v. rarius ad squamas minutas reducta. Stipulæ in paucis speciebus spinescentes in plerisque parvæ v.* 0. *Aculei* 0. *Species* 1–277, *omnes Australienses v. ins. Oceani Pacifici.*

Subseries 1. *Alatæ*. Phyllodia bifariam decurrentia in alas secus ramos 2 oppositas, nunc brevia et acuta nunc rigida et pungentia. Capitula globosa.—Species 1–5.

Subseries 2. *Continuæ*. Phyllodia rigida, pungentia, cum caule continua et breviter irregulariterque v. trifariam decurrentia. Capitula globosa v. rarius spicæ cylindraceæ.—Species 6–10.

Subseries 3. *Pungentes*. Phyllodia rigida, pungentia, in ramo articulata v. rarius 0. Capitula globosa v. spicæ cylindraceæ.—Species 11–45.

A. *Aphyllæ.* Rami spinescentes, phyllodiis nullis. Capitula globosa.—Species 11.

B. *Plurinerves.* Phyllodia 2- plurinervia v. teretia et enervia. Capitula globosa.—Species 12–25.

C. *Uninerves.* Phyllodia 1-nervia. Capitula glabra.—Species 26–40.

D. *Spicatæ.* Phyllodia 1–3-nervia. Spicæ cylindraceæ oblongæ v. ovoideæ.—Species 41–45.

Subseries 4. *Calamiformes.* Phyllodia anguste linearia, teretia v. tetragona, rarius leviter compressa, obtusa v. mucrone innocuo acuta, in ramo articulata, 1–3-nervia, v. rarius 0. Capitula globosa.—Species 46–63.

A. *Subaphyllæ.* Phyllodia 0 v. tenuissima, ramis similia.—Species 46, 47.

B. *Plurinerves.* Phyllodia nervis utrinque 2–3-striata.—Species 48–54.

C. *Uninerves.* Phyllodia nervis utrinque solitariis plana v. tetragona v. enervia.—Species 55–63.

Subseries 5. *Brunioideæ.* Phyllodia numerosa, parva, verticillata v. fasciculata, obtusa v. apiculo innocuo acuta. Capitula globosa.—Species 64–71.

Subseries 6. *Uninerves.* Phyllodia plana, non pungentia (exceptis speciebus paucis latifoliis), uninervia v. rarius 2-nervia. Capitula globosa.—Species 72–163.

A. *Spinescentes.* Rami spinescentes. Phyllodia parva. Glandula marginalis 0. Stipulæ minutæ v. 0. Pedunculi 1-cephali.—Species 72–76.

B. *Armatæ.* Rami non spinescentes. Stipulæ sæpius persistentes, spinescentes v. subulatæ. Phyllodia rarius $1\frac{1}{2}$-pollicaria, costa subcentrali. Glandula marginalis 0. Pedunculi 1-cephali.—Species 77–89.

C. *Triangulares.* Rami rigidi, interdum spinescentes. Stipulæ spinescentes subulatæ v. 0. Phyllodia parvula, costa sæpius margini inferiori approximata, latere superiore rotundata v. angulata sæpeque glandulifera. Pedunculi 1-cephali.—Species 90–99.

D. *Brevifoliæ.* Rami non spinescentes. Stipulæ minutæ v. 0. Phyllodia sæpius infrapollicaria, lata v. angusta, non pungentia. Pedunculi 1-cephali.—Species 100–111.

E. *Angustifoliæ.* Rami non spinescentes. Stipulæ sæpius minutæ v. 0, rarius spinescentes. Phyllodia ultrapollicaria, oblongo-lanceolata v. linearia, costa subcentrali. Pedunculi 1-cephali.—Species 112–122.

F. *Racemosæ.* Rami non spinescentes. Stipulæ minutæ v. 0. Phyllodia varia. Pedunculi plerique v. omnes pleiocephali.—Species 123–163.

Subseries 7. *Plurinerves.* Phyllodia plana, mutica (exceptis speciebus paucis latifoliis), utrinque 2- v. plurinervia. Capitula globosa, solitaria v. fasciculata.—Species 164–211.

A. *Armatæ.* Stipulæ spinescentes. Phyllodia falcata, subulato-acuminata v. fere pungentia.—Species 164, 165.

B. *Triangulares.* Stipulæ setosæ v. minutæ. Phyllodia parva, late falcato-ovata v. triangularia, sæpe subpungentia.—Species 166–169.

C. *Brevifoliæ.* Stipulæ inconspicuæ. Phyllodia parvula, obtusissima, sæpe undulata.—Species 170–173.

D. *Oligoneuræ.* Phyllodia oblongo-lanceolata v. linearia, rectiuscula, utrinque 2–3-nervia.—Species 174-180.

E. *Microneuræ.* Glabræ v. glaucæ nec glutinosæ. Phyllodia crassiuscula, nervis tenuibus parallelis vix prominulis v. omnino inconspicuis.—Species 181–187.

F. *Nervosæ.* Sæpe glutinosæ, rarius cano-pubescentes. Phyllodia recta v. falcata, nervis pluribus prominulis, rarius in phyllodio angusto 3.—Species 188–206.

G. *Dimidiatæ.* Phyllodia sæpius ampla, lata, valde obliqua, nervis 2–4 prominentibus distantibus inter nervos reticulato-pennivenia.—Species 207–211.

Subseries 8. *Julifloræ.* Phyllodia varia, sæpius complanata et plurinervia. Spicæ cylindraceæ v. rarius breviter oblongæ.—Species 212–277.

A. *Rigidulæ.* Phyllodia plana, sæpe brevia. Spicæ sæpius densæ. Flores 5-meri.—Species 212–226.

B. *Tetrameræ*. Phyllodia plana, linearia lanceolata oblonga v. obovata. Spicæ sæpe laxiusculæ. Flores 4-meri. Species 227–231.

C. *Stenophyllæ*. Phyllodia lineari-subulata v. anguste linearia, sæpius elongata et rectiuscula. Spicæ densæ, breves v. tenues. Flores parvi, 5-meri v. in speciebus teretifoliis interdum 4-meri.—Species 232–245.

D. *Falcatæ*. Phyllodia sæpius ampla, plus minus falcata, apice basique angustata, æqualiter multinervia v. nervo centrali v. pluribus validioribus. Spicæ tenues, sæpius densæ. Flores plerique 5-meri.—Species 246–272.

E. *Dimidiatæ*. Phyllodia ampla, lata, valde obliqua, nervis 3 v. pluribus prominentibus basi latere inferiore confluentibus, inter nervos reticulata.—Species 273–277.

Series 2. Botryocephalæ. *Folia bipinnata. Stipulæ parvæ v.* 0. *Capitula globosa, in pedunculo communi ebracteato plures.—Species* 278–287, *omnes Australienses.*

Series 3. Pulchellæ. *Frutices inermes v. rarius spinis axillaribus armati. Folia bipinnata. Stipulæ parvæ v.* 0. *Capitula globosa v. rarius spicæ cylindraceæ, ad axillas v. in racemo terminali pedunculata. Species* 288–295, *omnes Australienses.*

Series 4. Gummiferæ. *Arbores v. frutices non scandentes nec aculeati. Folia bipinnata. Stipulæ nonnullæ v. omnes spinescentes. Capitula globosa v. spicæ cylindraceæ, ad axillas v. in racemo terminali brevi pedunculata, rarius paniculata. Species* 296–355; *tropicæ v. subtropicæ utriusque orbis.*

Subseries 1. *Summibracteatæ*. Involucellum annulare sub capitulo ipso v. ab eo parum distans. Capitula globosa. Legumen crassum, turgidum v. rarius planum, non v. vix dehiscens, intus inter semina farctum. Species 296–308. Americanæ v. Africanæ, una cosmopolitana.

Subseries 2. *Medibracteatæ*. Involucellum in medio pedunculo v. paullo altius v. inferius situm, rarius 0. Capitula globosa. Legumen bivalve.—Species 309–347.

A. *Heteracanthæ*. Spinæ minores recurvæ, auctæ rectæ. Legumen demum turgidum v. subteres.—Species gerontogeæ, 309–317.

B. *Moniliformes*. Spinæ omnes rectæ, v. minores recurvæ. Legumen planum, sæpe crassum, inter semina regulariter constrictum v. depressum. Species gerontogeæ, 318–320.

C. *Thyrsifloræ*. Spinæ omnes rectæ. Inflorescentia terminalis, subaphylla, simplex. Legumen planum, continuum.—Species Africanæ, 321–324.

D. *Pubifloræ*. Spinæ rectæ. Pedunculi axillares. Flores pubescentes. Legumen planum, continuum.—Species gerontogeæ, 325–326.

E. *Normales*. Spinæ rectæ. Pedunculi axillares. Flores glabri v. parce puberuli. Legumen sæpius planum, valvis tenuibus.—Species 327–345. Pleræque Africanæ; paucæ Indicæ, Australicæ v. Mexicano-Texanæ.

F. *Paniculatæ*. Spinæ rectæ. Panicula terminalis, subaphylla. Species Asiaticæ, 346, 347.

Subseries 3. *Basibracteatæ*. Involucellum nullum nisi ad basin pedunculi. Spicæ cylindraceæ v. elongatæ, v. in una specie (*A. sphærocephala*) globosæ.—Species 348–355. Americanæ, Africanæ v. Asiaticæ.

Series 5. Vulgares. *Arbores v. frutices interdum scandentes. Stipulæ non spinescentes. Aculei infrastipulares sparsi v.* 0. *Folia bipinnata, petiolo sæpissime glandulifero.—Species* 356–430.

Subseries 1. *Gerontogeæ Spicifloræ*.—Species 356–380.

A. *Triacanthæ*. Aculei terni, infrastipulares cum infrafoliaceo.—Species 356–358.

B. *Diacanthæ*. Aculei gemini, infrastipulares.—Species 359–376.

C. *Ataxacanthæ*. Aculei sparsi.—Species 377–380.

Subseries 2. *Americanæ Spicifloræ*. Aculei sparsi v. 0.—Species 381–399.

Subseries 3. *Americanæ Capitulatæ*.—Species 400–425.

Subseries 4. *Gerontogeæ Capitulatæ*.—Species 426–430.

Series 6. Filicinæ. *Frutices inermes, hirsuti v. glabrati. Folia bipinnata petiolo eglanduloso. Flores in capitulo sæpius globoso pedicellati.—Species* 431, 432; *regionis Mexicanæ.*

Series 1. PHYLLODINEÆ.

Folia omnia (nisi primordialia et in perpaucis speciebus pauca hinc inde subbipinnata) ad phyllodia teretia angulata v. sæpius verticaliter complanata reducta, glandula petiolari dum adsit in margine superiore sita. Legumen quam maxime variabile. Species omnes Australienses v. insulares.

Subseries 1. Alatæ. *Phyllodia bifariam secus caulem decurrentia alas formantia 2 oppositas. Capitula globosa, ad axillas pedunculata v. rarius ramulis floriferis abbreviatis subaphyllis subracemosa.*

1. A. ? BOSSIÆOIDES, *A. Cunn., Benth. ! in Hook. Lond. Journ.* i. 323. Rami continue alati. Phyllodiorum pars libera brevis, triangularis, parte decurrente cum phyllodio internodii inferioris continua, nec ut in cæteris speciebus ad quemque nodum interrupta, gemma axillari a caule vero distante. Flores et fructus ignoti.—*Fl. Austral.* ii. 320.

Hab. North-west Australia.

This species, so remarkable in the structure of the winged stem, may not be an *Acacia*; but I know of no other genus to which it could be referred. It has not been again found since first named by A. Cunningham.

2. A. GLAUCOPTERA, *Benth. ! in Linnæa*, xxvi. 604. Glabra, glauca. Stipulæ parvæ. Phyllodiorum pars libera oblongo-falcata, eglandulosa, $\frac{3}{4}$–$1\frac{1}{2}$ poll. longa, basi 3–4 lin. lata, costa centrali. Capitula dense multi- (ultra 30-)flora. Legumen ignotum.—*Fl. Austral.* ii. 320.

A. bossiæoides, Seem. Eingef. Acac. t. 1, non Cunn.

Hab. South-west Australia.

3. A. ALATA, *R. Br. ! in Ait. Hort. Kew.* ed. 3, v. 464. Glabra v. hirsuta. Stipulæ spinescentes. Phyllodiorum pars libera ovato-falcata, $\frac{1}{2}$–$\frac{3}{4}$-pollicaris, margine superiore in angulum glanduliferum dilatato, costa subcentrali in mucronem v. spinulam excurrente. Capitula 6–12-flora. Legumen stipitatum, oblongo-falcatum v. lanceolatum, marginibus incrassatis, valvis convexis.—*Wendl. Comm. Acac.* t. 1; *Bot. Reg.* t. 396; *Colla, Hort. Rip.* t. 17; *Reichb. Ic. et Descr. Pl.* t. 88. f. 1.; *Benth. Fl. Austral.* ii. 320.

Var. PLATYPTERA, phyllodiis majoribus apice recurvis vix pungentibus.

A. platyptera, Lindl. ! Bot. Reg. t. 841, Misc. 3; Bot. Mag. t. 3933.

A. uniglandulosa, Seem. et Schmidt in Flora, 1844, 495.

Hab. South-west Australia.

4. A. DIPTERA, *Lindl. ! Swan Riv. App.* 15. Glabra et glauca v. pubescens. Phyllodia pauca, angusta, incurva, in alas angustas decurrentia, costa in parte libera submarginali. Capitula multiflora. Petala 5, lævia. Legumen stipitatum, 2-pollicare, angustum, planum, margine nerviformi.—*Hook. Ic. Pl.* t. 369; *Benth. Fl. Austral.* ii. 321.

A. Willdenowiana, Wendl. ex Seem. Eingef. Acac. 9.

Var. ERIOPTERA, Grah. in Bot. Mag. t. 3939, pubescens.

Hab. South-west Australia.

5. A. STENOPTERA, *Benth. ! in Hook. Lond. Journ.* i. 325. Glabra v. scabriuscula. Phyllodia lanceolato- v. lineari-falcata, rigida, recurva, in alas angustas decurrentia,

costa in parte libera submarginali. Capitula pauciflora. Petala 4, striata. Legumen longe stipitatum, falcatum, acuminatum, valvis convexis, marginibus utrinque longitudinaliter alatis !—*Fl. Austral.* ii. 321.

Hab. South-west Australia.

Subseries 2. Continuæ. *Phyllodia angusta, rigida, apice attenuata pungentia, basi cum caule continua et breviter trifariam v. irregulariter decurrentia. Capitula globosa v. spicæ oblongo-cylindraceæ, ad axillas pedunculata. Species omnes glabræ. Stipulæ minutæ v.* 0.

6. A. INCURVA, *Benth. ! in Hook. Lond. Journ.* i. 325. Phyllodia plana, linearia v. lineari-lanceolata, 1½–2-pollicaria, uninervia. Capitula globosa, fere sessilia, 4–8-flora. Legumen ignotum.—*Fl. Austral.* ii. 322.

A. brachyptera, Benth. ! in Hook. Lond. Journ. i. 325.

Hab. South-west Australia.

7. A. TRIGONOPHYLLA, *Meissn. ! in Pl. Preiss.* ii. 199. Phyllodia plana, lineari-lanceolata, 1–1½-pollicaria, uninervia. Capitula globosa, 40–50-flora, pedunculo ¼–½-pollicari. Legumen planum, rectum, 2–3-pollicare, 2½ lin. latum, marginibus incrassatis, inter semina constrictum. *Fl. Austral.* ii. 322.

A. pteroclada, F. Muell. ! Fragm. Phytogr. Austral. iv. 3.

Hab. South-west Australia.

8. A. CONTINUA, *Benth. ! Fl. Austral.* ii. 322. Phyllodia teretia, plurinervia, inferiora 1–2-pollicaria, superiora minora v. ad spinas breves reducta, brevissime decurrentia. Capitula globosa, multiflora, brevissime pedunculata. Legumen planum, ad 2 lin. latum, valde incurvum v. contortum.

A. colletioides, F. Muell. ! Pl. Vict. ii. 5, non A. Cunn.

Hab. Extratropical Australia: scrubs and desert land of the Murray and South Australia.

9. A. PEUCE, *F. Muell. ! Fragm. Phyt. Austral.* iii. 151. Phyllodia conferta, teretisubulata, paucinervia, rigidula, 2–3-pollicaria, brevissime decurrentia. Flores ignoti. Legumen planum, pluripollicare, fere 1½ poll. latum.—*Fl. Austral.* ii. 323.

Hab. Central Australia.

10. A. TRIPTERA, *Benth. ! in Hook. Lond. Journ.* i. 325. Phyllodia lanceolata, recurvo-falcata, ½–1-pollicaria, plurinervia. Spicæ breviter pedunculatæ, cylindraceæ, ½–¾-pollicares. Legumen ignotum.—*Fl. Austral.* ii. 323.

Hab. Eastern subtropical Australia.

Subseries 3. Pungentes. *Frutices rigidi, ramis in paucis speciebus spinescentibus. Phyllodia ad caulem articulata, rigida, apice attenuato-pungentia, sæpius subulata linearia v. lanceolata, rarius desunt. Capitula globosa v. spicæ cylindraceæ, axillares.*

(Confer etiam species paucas subserierum 4. *Calamiformes,* et 7. *Plurinerves,* phyllodiis subpungentibus.)

A. Aphyllæ. *Phyllodia ad squamas minutas reducta.*

11. A. SPINESCENS, *Benth. ! in Hook. Lond. Journ.* i. 323. Glabra, ramulis striatis apice sæpius spinescentibus. Capitula globosa, 2–6-flora, ad nodos sessilia. Legumen breviter stipitatum, lineare, 1½ lin. latum, planum, curvum, subtorulosum.—*Fl. Austral.* ii. 323.

Hab. Extratropical Australia: desert interior of the eastern colonies.

B. Plurinerves. *Phyllodia* 2- *v. plurinervia v. teretia et avenia. Capitula globosa.*

* *Phyllodia plana, lineari-lanceolata,* 3- *v. plurinervia. Petala sæpius lævia.*

12. A. LATIPES, *Benth. ! in Hook. Lond. Journ.* i. 334. Glabra. Phyllodia rigidissima, vix pollicaria, ad lineam lata, basi lata affixa, utrinque 3–4-nervia. Sepala distincta, anguste lineari-spathulata. Petala lævia. Legumen ignotum.—*Fl. Austral.* ii. 324.

Hab. South-west Australia.

13. A. COCHLEARIS, *Wendl. Comm. Acac.* 15. Glabra. Phyllodia rigida, 1–1½-pollicaria, ad 2 lin. lata, basi contracta, utrinque 3–4-nervia. Sepala distincta, angusta, lineari-spathulata. Petala lævia. Legumen 1–2-pollicare, 2 lin. latum, planum, marginibus incrassatis.—*Fl. Austral.* ii. 324.

Mimosa cochlearis, Labill. ! Pl. Nov. Holl. ii. 85, t. 234.

Acacia eglandulosa, DC. Mém. Lég. 445.

A. Benthamii, Meissn. ! in Pl. Preiss. i. 11.

Hab. South-west Australia.

14. A. LANIGERA, *A. Cunn. ! in Field, New S. Wales,* 345. Ramuli sæpius lanato-pubescentes. Phyllodia rigida, 1–1½-, rarius 2-pollicaria, 2–3 lin. lata, basi contracta, utrinque 3–4-nervia. Pedunculi brevissimi. Calyx campanulatus, lobis obtusis. Petala lævia. Legumen nunc glabrum, 6–8-pollicare, ad semina 4–6 lin. latum, inter semina contractum, nunc brevius angustius et lanato-villosum.—*Bot. Mag.* t. 2922; *Benth. Fl. Austral.* ii. 324.

A. multinervia, DC. Mém. Lég. 445; Prod. ii. 450.

Hab. Extratropical Australia: desert interior of the eastern colonies.

In some of Cunningham's specimens which I have recently examined I find the rather obscure indented gland on the upper margin of most of the phyllodia, of which there is no trace on other specimens. This leaves no longer any doubt as to the identity of DeCandolle's plant with Cunningham's; but amongst the latter there appear to be two marked forms—a pubescent one with the smaller pod, in which the gland is sometimes but not always observable, and a glabrous one, with a larger pod, in which the gland of the phyllodia is very rare. All are from the same localities. The two names were both published in the same year, 1825.

15. A. PHLEBOCARPA, *F. Muell. ! in Journ. Linn. Soc.* ii. 119. Glabra. Phyllodia rigida, 1–1½-pollicaria, 2–3 lin. lata, basi contracta, nervis utrinque plurimis 1–3 validioribus. Pedunculi subsemipollicares. Calyx campanulatus. Petala striata? Legumen durum, incurvum, oblique venosum, marginibus incrassatis. Semina obliqua.—*Benth. Fl. Austral.* ii. 325.

Hab. Tropical Australia: north coast.

16. A. TRINERVATA, *Sieb.! in DC. Prod.* ii. 451. Glabra v. puberula. Phyllodia rigida, anguste linearia, 1–1½-pollicaria v. breviora, basi leviter contracta, utrinque 2–3-nervia. Pedunculi subsemipollicares. Capitula parva. Calyx tenuis, campanulatus. Petala lævia. Legumen 3–5-pollicare, 1–1½, rarius 2 lin. latum, planum, marginibus vix incrassatis. Semina longitudinalia. *Benth. Fl. Austral.* ii. 325.

A. taxifolia, A. Cunn.! in Field, New S. Wales, 344.

A. Cunninghamii, G. Don, Gen. Syst. ii. 404.

Hab. Extratropical Australia: Blue Mountains, New S. Wales.

(See also 177. *A. heteroclita*, and 184. *A. Oswaldii*).

** *Phyllodia subteretia, striato-plurinervia v. subenervia. Petala lævia.*

17. A. COLLETIOIDES, *A. Cunn.*; *Benth.! in Hook. Lond. Journ.* i. 336. Glabra. Stipulæ minimæ v. 0. Phyllodia rigida, teretia v. vix compressa, ¾–1½-pollicaria, striato-plurinervia. Pedunculi vix 2 lin. longi. Flores parvi. Sepala distincta, lineari-spathulata. Legumen lineare, 2–2½ lin. latum, marginibus non incrassatis. Semina longitudinalia.—*Fl. Austral.* ii. 325.

A. nyssophylla, F. Muell.! Fragm. iv. 4, phyllodiorum nervis minus conspicuis.

Hab. Extratropical Australia: desert interior of the eastern colonies.

18. A. STRIATULA, *Benth.! in Hook. Lond. Journ.* i. 336. Rami minute puberuli. Stipulæ minimæ v. 0. Phyllodia rigida, subrecurva, teretia v. vix compressa, semipollicaria (v. longiora?), striato-plurinervia. Pedunculi 3–4-lineares. Sepala distincta, lineari-spathulata. Petala medio costata. Legumen ignotum.—*Fl. Austral.* ii. 326.

Hab. South-west Australia.

19. A. CAMPYLOPHYLLA, *Benth! in Linnæa*, xxvi. 605. Glabra. Stipulæ setaceæ, subpungentes. Phyllodia recurva v. flexuosa, teretia, ¾–1-pollicaria, striato-plurinervia. Pedunculi ½–¾-pollicares. Legumen lineare, angustum, marginibus elevatis.—*Fl. Austral.* ii. 326.

Hab. South-west Australia. The specimens not perfect.

20. A. TERETIFOLIA, *Benth.! in Hook. Lond. Journ.* i. 326. Glabra. Stipulæ subulato-spinescentes, parvæ, caducæ. Phyllodia teretia, ¾–1½-pollicaria, obscure nervata, minus quam in affinibus pungentia. Pedunculi phyllodiis breviores. Sepala lineari-spathulata, basi tantum connata. Petala apice incrassato-spathulata, concava. Legumen lineare, 2–4-pollicare, tereti-subtetragonum.—*Fl. Austral.* ii. 326.

Hab. South-west Australia.

21. A. SULCATA, *R. Br.! in Ait. Hort. Kew.* ed. 3, v. 460. Glabra. Stipulæ minutæ v. 0. Phyllodia conferta, teretia, infrapollicaria, profunde sulcato-striata. Pedunculi phyllodiis breviores. Sepala lineari-spathulata, distincta. Petala lævia. Legumen planum, valde flexuosum v. contortum, pollicare v. vix longius, 1½–2 lin. latum.—*Bot. Reg.* t. 928; *Wendl. Comm. Acac.* t. 10; *Benth. Fl. Austral.* ii. 327.

Hab. South-west Australia.

(See also 34. *A. sphacelata*, and 232. *A. aciphylla*.)

**** Phyllodia linearia v. lanceolata, recurva, nervis utrinque 2 submarginalibus crassis. Stipulæ setaceæ v. spinescentes.*

22. A. COSTATA, *Benth.! in Hook. Lond. Journ.* i. 339. Glabra v. pubescens sæpe spinescens. Stipulæ setaceæ, minutæ. Phyllodia lanceolata, 2–4 lin. longa, marginibus crassis nerviformibus. Pedunculi breves. Calyx alte et acute lobatus. Petala rigida, striata. Legumen ignotum.—*Fl. Austral.* ii. 327.

Hab. South-west Australia.

23. A. BARBINERVIS, *Benth.! in Hook. Lond. Journ.* i. 326. Laxe pubescens. Stipulæ parvæ, setaceæ, subpungentes. Phyllodia lineari-falcata, recurva, ¾–1-pollicaria, marginibus elevatis nerviformibus. Pedunculi phyllodio breviores. Calyx breviter dentatus. Petala crassa, striata. Legumen ignotum.— *Fl. Austral.* ii. 327.

Hab. South-west Australia.

24. A. ATAXIPHYLLA, *Benth.! in Linnæa*, xxvi. 605. Rami acutanguli, cano-puberuli, mox glabrati. Stipulæ parvæ, setaceæ, subpungentes. Phyllodia lineari-subulata, flexuosa, acumine uncinato pungente, 1½–2-pollicaria, prominente 2-nervia. Pedunculi vix semipollicares. Calyx alte lobatus. Petala striata. Legumen ignotum.—*Fl. Austral.* ii. 328.

Hab. South-west Australia.

25. A. BAXTERI, *Benth.! in Hook. Lond. Journ.* i. 327 (*errore* Bagsteri). Glabra. Rami acutanguli. Stipulæ setaceæ, caducæ. Phyllodia lineari-oblonga v. lanceolata, subfalcata, ½–1-pollicaria, marginibus v. nervis submarginalibus incrassatis. Pedunculi breves. Sepala distincta, lineari-spathulata. Petala lævia. Legumen ignotum.—*Fl. Austral.* ii. 328.

Hab. South-west Australia.

C. Uninerves. *Phyllodia utrinque nervo v. costa subcentrali percursa. Capitula globosa.*

** Petala striata.*

26. A. AURONITENS, *Lindl.! Sw. Riv. App.* 15. Rami sæpius hirtelli. Stipulæ setaceæ, subpungentes. Phyllodia conferta, subsemipollicaria, lineari-oblonga, costa subcentrali, marginibus tenuiter nerviformibus. Pedunculi phyllodia subæquantes. Sepala lineari-subulata, distincta. Legumen rectum, crassum, subpollicare, 3 lin. latum, marginibus latis lævibus.—*Benth. Fl. Austral.* ii. 328.

Hab. South-west Australia.

27. A. QUADRISULCATA, *F. Muell.! Fragm. Phyt. Austral.* iii. 127. Viscido-puberula v. glabra. Stipulæ minutæ. Phyllodia sparsa, anguste linearia, costa utrinque prominente, subtetragona, ¾–1½-pollicaria. Pedunculi phyllodio breviores. Sepala distincta, lineari-spathulata. Legumen rectiusculum, crassum, 1–1½-pollicare, fere 3 lin. latum, marginibus latis brevibus.—*Benth. Fl. Austral.* ii. 328.

Hab. South-west Australia.

*** Petala lævia v. 1-costata nec striata. Flores plerique 5-meri.*

28. A. ERIOCLADA, *Benth.! in Linnæa*, xxvi. 606. Rami sæpius spinescentes, lanati,

demum glabrati. Stipulæ setaceæ, subspinescentes, caducæ. Phyllodia oblongo-lanceolata, semipollice breviora, costa marginibusque nerviformibus prominentibus. Pedunculi 2–3 lin. longi. Sepala spathulata, vix soluta. Legumen ignotum.—*Fl. Austral.* ii. 329.

Hab. South-west Australia.

29. A. SICULIFORMIS, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 337. Glabra. Stipulæ minutæ. Phyllodia linearia v. lanceolata, $\frac{1}{2}$–$1\frac{1}{2}$-pollicaria, 1–2 lin. lata, costa prominula, marginibus vix incrassatis. Pedunculi $\frac{1}{4}$–$\frac{1}{2}$-pollicares. Sepala distincta, spathulata. Legumen stipitatum, planum, pollicem rarius excedens, $2\frac{1}{2}$–3 lin. latum.—*Fl. Austral.* ii. 329.

A. Stuartiana, F. Muell.! Benth. in Linnæa, xxvi. 609; Hook. f. Fl. Tasm. t. 19; Dietr. Fl. Univ. t. 82.

Hab. Extratropical Australia, Eastern colonies and Tasmania.

30. A. PATENS, *F. Muell.! in Journ. Linn. Soc.* iii. 120. Glabra. Stipulæ minutæ. Phyllodia lineari-lanceolata, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria, 1–$1\frac{1}{2}$ lin. lata. Pedunculi phyllodio sublongiores. Sepala distincta, lineari-spathulata. Legumen rectum, pollicare v. sublongius, $1\frac{1}{2}$ lin. latum, inter semina contractum.—*Fl. Austral.* ii. 329.

A. Maitlandi, F. Muell.! Fragm. Phytogr. Austral. iii. 46.

Hab. Tropical Australia, north-west coast.

31. A. LARICINA, *Meissn.! in Pl. Preiss.* i. 6. Rami cano-tomentosi. Stipulæ setaceæ, subspinescentes. Phyllodia anguste linearia, recurvo-patentia, $\frac{1}{2}$–$\frac{3}{4}$-, rarius 1-pollicaria, costa utrinque prominula subtetragona. Pedunculi graciles, phyllodio breviores. Capitula parva. Calyx breviter dentatus. Legumen junius incurvum, angustum, utrinque valde convexum.—*Benth. Fl. Austral.* ii. 330.

Hab. South-west Australia.

32. A. TETRAGONOPHYLLA, *F. Muell.! in Journ. Linn. Soc.* iii. 121. Glabra. Stipulæ minimæ. Phyllodia ad nodos fasciculata, lineari-subulata, $\frac{1}{2}$–1-pollicaria, rigida, utrinque 1–2-nervia. Pedunculi phyllodiis subæquilongi. Sepala distincta, lineari-spathulata. Legumen valde curvum v. tortum, fere 3 lin. latum, marginibus incrassatis.—*Benth. Fl. Austral.* ii. 330.

Hab. South-east Australia, desert interior.

33. A. GENISTOIDES, *A. Cunn.! Benth. Fl. Austral.* ii. 330. Glabra, subspinescens. Stipulæ parvæ, caducæ. Phyllodia sparsa, lineari-subulata, pollicaria v. longiora, costa utrinque prominente. Pedunculi subsemipollicares. Sepala distincta, lineari-spathulata. Legumen curvulum, 1–3-pollicare, $2\frac{1}{2}$–3 lin. latum, valvis convexis.

Hab. South-west Australia.

34. A. SPHACELATA, *Benth.! in Hook. Lond. Journ.* i. 338. Glabra v. pubescens. Stipulæ minutæ. Phyllodia lineari-subulata, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria, utrinque 1-, rarius 2-nervia. Pedunculi brevissimi. Sepala distincta, lineari-spathulata, apice sphacelata. Legumen ignotum.—*Fl. Austral.* ii. 331.

A. sessilis, Benth.! in Hook. Lond. Journ. i. 336.

A. retrorsa, Meissn.! in Bot. Zeit. 1855. 10.

Hab. South-west Australia.

35. A. INGRATA, *Benth.! Fl. Austral.* ii. 321. Glabra v. minute pubescens. Phyllodia divaricata v. reflexa, lineari-subulata, basi subdilatata, semipollice breviora, costa utrinque prominente. Pedunculi breves. Calyx sinuato-dentatus. Legumen ignotum.

Hab. South-west Australia.

36. A. JUNIPERINA, *Willd. Spec.* iv. 1049. Glabra v. pubescens. Phyllodia divaricata, lineari-subulata, semipollicem rarius excedentia, basi subdilatata, costa utrinque prominente. Pedunculi phyllodiis sublongiores. Sepala spathulata, connata v. facile solvenda. Petala costata. Legumen falcatum, planum, 1–2-pollicare, ad 2 lin. latum. —*Lodd. Bot. Cab.* t. 398; *Benth. Fl. Austral.* ii. 331.

Mimosa juniperina, Vent. Jard. Malm. t. 64.
Mimosa ulicina, Wendl. Collect. i. 25, t. 6.
Mimosa ulicifolia, Salisb.? Prod. 324.
Acacia verticillata, Sieb.! Pl. Exs., non Willd.
A. echinula, DC. Prod. ii. 449.
A. pungens, Spreng. Syst. iii. 134.
A. acicularis, R. Br.! in Ait. Hort. Kew. ed. 3, v. 460, non Willd.
A. pugioniformis, Wendl. in Flora, 1819, 139, non ejusd. Collect.
A. Brownei, Steud.; DC. Prod. ii. 449; Lodd. Bot. Cab. t. 1333.
A. Arceuthos, Spreng. Syst. iii. 134.

Hab. Extratropical East Australia and Tasmania.

37. A. ASPARAGOIDES, *A. Cunn.! in Field, New S. Wales,* 343. Glabra. Stipulæ minutæ. Phyllodia patentia, lineari-subulata, $\frac{1}{2}$–$\frac{3}{4}$ poll. longa, costa utrinque prominente, margine superiore basi angulato-glandulosa. Capitula subsessilia. Sepala spathulata, facile solvenda. Legumen ignotum.—*Benth. Fl. Austral.* ii. 332.

Hab. Extratropical East Australia: Blue Mountains.

*** *Petala lævia. Flores sæpius 4-meri v. 3-meri.*

38. A. TENUIFOLIA, *F. Muell.! in Trans. Phil. Soc. Vict.* i. 37. Glabra v. pubescens. Stipulæ minutæ. Phyllodia lineari-subulata, tenuia, semipollicem rarius excedentia, costa utrinque prominente. Pedunculi tenues, phyllodio breviores. Sepala angusta, distincta v. basi subconnata. Legumen rectum v. curvum, 1–2-pollicare, fere 2 lin. latum, valvis convexis.—*Benth. Fl. Austral.* ii. 332.

Hab. South-east Australia: Victoria.

39. A. DIFFUSA, *Lindl.! Bot. Reg.* t. 634. Glabra. Stipulæ minutæ. Phyllodia linearia, $\frac{3}{4}$–1-pollicaria, 1–$1\frac{1}{2}$ lin. lata, costa utrinque prominente. Pedunculi semipollice breviores. Calyx breviter lobatus. Legumen stipitatum, sæpe 3–4-pollicare, ad 2 lin. latum, planum v. valvis demum convexis.—*Bot. Mag.* t. 2417; *Benth. Fl. Austral.* ii. 332.

A. prostrata, Lodd. Bot. Cab. t. 631.
A. cuspidata, A. Cunn.! Benth. in Hook. Lond. Journ. i. 337.
A. genistifolia, Link! Enum. Hort. Berol. ii. 442.

Hab. South-eastern Australia and Tasmania.

40. A. RUPICOLA, *F. Muell.! Benth. in Linnæa,* xxvi. 610. Glabra. Phyllodia linearia

v. sublanceolata, semipollicem rarius excedentia, basi latiora quam in *A. diffusa*. Pedunculi semipollicares. Calyx breviter lobatus. Legumen 1–2-pollicare, ad 2 lin. latum.—*Dietr. Fl. Univ.* t. 8; *Benth. Fl. Austral.* ii. 333.

Hab. South Australia.

Very closely allied to *A. diffusa*. The funicle of the seed is more dilated into a broad aril; but this character may not be constant.

(See also the short-spiked specimens of 41. *A. rhigiophylla*, and 45. *A. axillaris*.)

D. Spicatæ. *Phyllodia* 1–3-*nervia*. *Spicæ cylindraceæ oblongæ v. rarius ovoideæ.*

41. A. RHIGIOPHYLLA, *F. Muell.! Benth. in Linnæa*, xxvi. 611. Glabra v. vix viscido-puberula. Phyllodia linearia v. lineari-lanceolata, crassa, $\frac{1}{2}$–1-pollicaria, utrinque 2–3-nervia. Capitula subsessilia, oblonga v. subglobosa, pauciflora. Calyx breviter lobatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 333.

Hab. South Australia.

42. A. OXYCEDRUS, *Sieb.! in DC. Prod.* ii. 453. Ramuli pubescentes. Phyllodia sparsa v. subverticillata, lineari-lanceolata, $\frac{1}{2}$–1-pollicaria, utrinque 3–4-nervia. Spicæ densæ, subpollicares, pedunculatæ. Calyx obtuse lobatus. Legumen incurvum, ad 3-pollicare, 3 lin. latum, valvis convexis striatis.—*Sweet, Fl. Austral.* t. 6; *Bot. Mag.* t. 2928; *Reichb. Icon. Exot.* t. 120; *Benth. Fl. Austral.* ii. 334.

Hab. Extratropical East Australia and Tasmania.

43. A. VERTICILLATA, *Willd. Spec.* iv. 1049. Ramuli sæpius pubescentes. Phyllodia verticillata v. rarius sparsa, in forma typica lineari-subulata, subsemipollicaria v. breviora, rarius longiora, costa utrinque prominula additis rarius nervis 1–2 lateralibus. Spicæ densæ, cylindraceæ, $\frac{1}{2}$–1-pollicares, rarius breviter ovoideæ, pedunculatæ. Calyx breviter lobatus. Legumen rectum v. curvum, $1\frac{1}{2}$–2-pollicare, 2 lin. latum.—*Lodd. Bot. Cab.* t. 535; *Benth. Fl. Austral.* ii. 334.

Mimosa verticillata, Lher. Sert. Angl. 30; Vent. Jard. Malm. t. 63; Bot. Mag. t. 110.

Acacia semiverticillata, Knowl. et Westc. Fl. Cab. ii. 27.

Var. LATIFOLIA. Phyllodia lanceolata v. oblonga.

A. ruscifolia, A. Cunn.! in G. Don, Gen. Syst. ii. 407; Bot. Mag. t. 3195.

A. mæsta, Lindl.! Bot. Reg. 1846, t. 67.

Var. OVOIDEA. Phyllodia formæ typicæ. Spicæ abbreviatæ sæpius ovoideæ, paucifloræ.

A. ovoidea, Benth.! in Hook. Lond. Journ. i. 339; Hook. f. Fl. Tasm. t. 20; Dietr. Fl. Univ. t. 8.

44. A. RICEANA, *Hensl.! in Maund, Botanist*, t. 135. Glabra. Phyllodia sparsa v. subverticillata, linearia v. subulata, 1–$1\frac{1}{2}$-pollicaria, utrinque 1-nervia. Spicæ laxæ, tenues, sæpe pollicem excedentes. Flores sæpius 3-meri. Calyx breviter et obtuse lobatus. Legumen sæpius curvum, 2–3-pollicare, $1\frac{1}{2}$ lin. latum, inter semina contractum, valvis convexis.—*Benth. Fl. Austral.* ii. 335.

A. setigera, Hook.! Ic. Pl. t. 316.

A. erythropus, Ten. Cat. Ort. Nap. 77, ex char.

A. taxifolia, Lodd. Bot. Cab. t. 1225.

Hab. Tasmania.

45. A. AXILLARIS, *Benth.! in Hook. Lond. Journ.* i. 341. Glabra. Phyllodia *A. Riceanæ*

v. longiora, præter costam nervis lateralibus tenuibus sæpe percursa. Spicæ breves, pauciflores, subsessiles. Cætera *A. Riceanæ.—Benth. Fl. Austral.* ii. 335.

Hab. Tasmania.

Subseries 4. Calamiformes. *Phyllodia rarius subnulla, sæpius anguste lineuria v. subulata, teretia tetragona v. leviter compressa, in caule articulata, obtusa v. mucrone recurvo innocuo terminata,* 1- *v. plurinervia. Capitula globosa, ad axillas solitaria v. breviter racemosa.*

A. Subaphyllæ. *Phyllodia nulla v. perpauca sub inflorescentia tenuia ramulisque similia.*

46. A. TETRAGONOCARPA, *Meissn. ! in Pl. Preiss.* i. 4. Glabra. Rami tenues, juncei. Capitula ad nodos breviter pedunculata, 3–4-flora. Petala striata. Legumen subpollicare, acutum, 2–3 lin. latum, marginibus utrinque angulo valde prominulo percursis, acute tetragonum.—*Benth. Fl. Austral.* ii. 336.

Tetracheilos Meissneri, Lehm. ! Pl. Preiss. ii. 368.

Hab. South-west Australia.

47. A. RESTIACEA, *Benth. ! in Hook. Lond. Journ.* i. 323. Glabra. Rami tenues, juncei. Capitula breviter racemosa, novella bracteis squamiformibus imbricatis caducissimis obtecta. Petala lævia. Legumen (*ex Lehm.*) lineare, moniliforme, valvis reticulatis.—*Benth. Fl. Austral.* ii. 336.

A. squamata, Morren in Ann. Soc. Hort. Gand, iii. 209, t. 134, ex char. in Walp. Ann. i. 264, non Lindl.

Chithonanthus restiaceus, Lehm. ! Pl. Preiss. ii. 368.

Hab. South-west Australia.

B. Plurinerves. *Phyllodia nunc striato-*2- *v. plurinervia, nunc nervis numerosis tenuissimis vix oculo nudo conspicuis.*

48. A. SQUAMATA, *Lindl., Sw. Riv. App.* 15. Glabra. Rami juncei. Phyllodia pauca, tenuiter striata, ramulis similia, sub-2-pollicaria. Capitula ad axillas breviter racemosa, novella squamis imbricatis obtecta, singula 6–10-flora. Calyx et corolla ad annulum minimum reducta v. 0. Stamina numerosa. Legumen ignotum.—*Benth. Fl. Austral.* ii. 336; *Hook. Ic. Pl.* t. 367.

Hab. South-west Australia.

49. A. BRACHYPHYLLA, *Benth. ! in Linnæa,* xxvi. 615. Rami lanato-pubescentes v. demum glabrati. Phyllodia lineari-teretia, semipollice breviora, striato-plurinervia. Pedunculi breves. Legumen flexuosum, 1–2-pollicare, planum, vix $1\frac{1}{2}$ lin. latum, marginibus tenuiter nerviformibus.—*Benth. Fl. Austral.* ii. 337.

Hab. South-west Australia.

50. A. BYNOEANA, *Benth. ! in Linnæa,* xxvi. 614. Laxe puberula. Phyllodia linearia-teretia, striato-plurinervia, apice recurva, rarius pollicem excedentia. Pedunculi 3–4 lin. longi. Calycis lobi angusti. Petala angusta. Legumen curvatum, planum, vix linea latius, marginibus incrassatis.—*Fl. Austral.* ii. 337.

A. leptophylla, F. Muell.! Fragm. Phytogr. Austral. iv. 9.

Hab. Tropical Australia: north-west coast.

51. A. TRIPTYCHA, *F. Muell.! Benth. Fl. Austral.* ii. 337. Subglabra. Phyllodia linear-subulata, 1½–3-pollicaria, utrinque prominule 2–3-nervia. Pedunculi breves. Sepala distincta, lineari-spathulata. Legumen ignotum.

Hab. South-west Australia.

52. A. LEPTONEURA, *Benth.! in Hook. Lond. Journ.* i. 341. Glabra v. rami canescentes. Phyllodia lineari-subulata, subteretia, sub-2-pollicaria, tenuissime multinervia. Pedunculi breves. Sepala subdistincta, lineari-spathulata. Legumen ignotum.—*Bot. Mag.* t. 4350; *Benth. Fl. Austral.* ii. 337.

Hab. South-west Australia.

53. A. RIGENS, *A. Cunn.! in G. Don, Gen. Syst.* ii. 403. Glabra v. minute cano-pubescens. Phyllodia lineari-subulata, subteretia, 2–3-pollicaria, utrinque tenuiter 3–5-nervia. Pedunculi brevissimi. Sepala spathulata, ad medium connata. Legumen lineare, 1½ lin. latum, inter semina valde contractum.—*Benth. Fl. Austral.* ii. 337.

A. chordophylla, F. Muell.! in Linnæa, xxvi. 612.

Hab. Extratropical East Australia, desert interior of the eastern colonies.

54. A. PAPYROCARPA, *Benth.! Fl. Austral.* ii. 338. Glabra v. minute cano-pubescens. Phyllodia lineari-subulata, leviter compressa, 2–3-pollicaria, recurvo-acuminata, oculo armato tenuissime multinervia. Legumen planum, flexuosum, 3–4-pollicare, 4–5 lin. latum, valvis tenuibus.

Hab. South Australia, only seen in Herb. R. Brown.

C. Uninerves. *Phyllodia utrinque* 1-*nervia v. enervia.*

* *Phyllodia* 1½-*pollicaria et longiora.*

55. A. PUGIONIFORMIS, *Wendl. Comm. Acac.* 38, t. 9. Glabra. Phyllodia lineari-subulata, 1½–2-, rarius 3-pollicaria, acumine brevi recto, costa utrinque prominula subtetragona. Pedunculi 2–3 rarius 5–6 lin. longi, 1-cephali. Sepala lineari-spathulata, demum libera. Petala costata. Legumen ignotum.—*Benth. Fl. Austral.* ii. 338.

A. quadrilateralis, DC.! Prod. ii. 451.

Hab. Extratropical East Australia. Said also to be found in Timor, but most likely mistaken for the following species.

56. A. JUNCIFOLIA, *Benth.! in Hook. Lond. Journ.* i. 341. Glabra. Phyllodia lineari-subulata, subcompressa, 3–6-pollicaria, costa utrinque vix prominula. Pedunculi vix semipollicares, 1-cephali. Sepala lineari-spathulata, demum libera. Petala lævia. Legumen rectum, sæpe 3–4 poll. longum, 1½–2 lin. latum.—*Fl. Austral.* ii. 339.

A. pinifolia, Benth.! in Mitch. Trop. Austr. 342.

Hab. Tropical Australia, north coast, and Eastern subtropical Australia. Also in Timor?

57. A. CALAMIFOLIA, *Sweet in Lindl.! Bot. Reg.* t. 839. Glabra sæpeque glauca. Phyllodia lineari-subulata, 2–4-pollicaria, teretia v. subcompressa, enervia v. utrinque tenuiter 1-nervia. Pedunculi sæpius breviter 3–4-cephali. Calyx breviter lobatus.

Petala lævia. Legumen sæpius curvum, 5–6-pollicare, 2–2½ lin. latum, inter semina distantia valde contractum.—*Lodd. Bot. Cab.* t. 909; *Benth. Fl. Austral.* ii. 339.

A. pulverulenta, A. Cunn.! Benth. in Hook. Lond. Journ. i. 342.

A. Wilhelmiana. F. Muell.! in Trans. Phil. Inst. Vict. i. 37, phyllodiis brevioribus.

A. nematophylla, F. Muell.! Benth. in Linnæa, xxvi. 612, ex parte.

Hab. Extratropical Australia, desert interior of the eastern colonies.

A. canaliculata, Sweet, Hort. Brit. 164, name only, is probably either this species or the *A. extensa*.

58. A. SCIRPIFOLIA, *Meissn.! in Bot. Zeit.* 1855, 10. Glabra. Phyllodia lineari-subulata, teretia v. leviter compressa, 3–5-pollicaria, utrinque obscure 1-nervia. Pedunculi breves, 1-cephali. Calyx truncatus. Legumen elongatum, ad 2 lin. latum, inter semina contractum, valvis duris convexis.—*Fl. Austral.* ii. 339.

Hab. South-west Australia.

59. A. EXTENSA, *Lindl.! Sw. Riv. App.* 15. Glabra. Rami elongati, acutissime angulati. Phyllodia lineari-subulata, brevia v. pluripollicaria, utrinque prominule costata. Pedunculi 1-cephali v. breviter pleiocephali. Calyx truncatus. Legumen elongatum, 1½ lin. latum, inter semina contractum, valvis tenuiter coriaceis.—*Benth. Fl. Austral.* ii. 340.

A. graminea, Lehm.! Del. Sem. Hort. Hamb. 1842.

A. pentaedra, Regel, Gartenfl. i. 228, t. 24.

Hab. South-west Australia.

*** Phyllodia brevia rarius pollicem excedentia.*

60. A. GONOPHYLLA, *Benth.! in Linnæa*, xxvi. 613. Glabra. Phyllodia linearia, curva, 1–1½-pollicaria, costa utrinque acute prominente tetragona. Pedunculi 2–4-lineares. Calyx tenuis, sepalis demum solvendis. Legumen lineare, 2 lin. latum, inter semina subcontractum.—*Benth. Fl. Austral.* ii. 340.

Hab. South-west Australia.

61. A. ERICIFOLIA, *Benth.! in Hook. Lond. Journ.* i. 345. Glabra v. laxe hirtella. Phyllodia conferta, lineari-teretia v. subcompressa, ½–¾- v. rarius 1-pollicaria, enervia v. obscure 1-nervia. Pedunculi breves. Sepala distincta, lineari-spathulata. Legumen junius durum, subteres, maturum ignotum.—*Benth. Fl. Austral.* ii. 340.

A. Hookeri, Meissn.! in Pl. Preiss. i. 12.

Hab. South-west Australia.

62. A. UNCINELLA, *Benth.! in Linnæa*, xxvi. 613. Glabra v. junior minute puberula. Phyllodia lineari-subulata, subteretia, basi attenuata quasi petiolata, vix pollicaria, uno latere obscure 1–3-nervia. Pedunculi 2–4 lin. longi. Sepala distincta, lineari-spathulata. Legumen lineare, ad 1½ lin. latum, inter semina contractum.—*Fl. Austral.* ii. 341.

Hab. South-west Australia.

63. A. OXYCLADA, *F. Muell.! Benth. Fl. Austral.* ii. 341. Glabra, ramis sæpe spinescentibus. Phyllodia lineari-teretia v. subcompressa, 3–4 lin. longa, uno latere obscure 1–3-nervia, basi attenuata quasi petiolata. Flores ignoti. Legumen flexuosum, pollicare, 1½ lin. latum.

Hab. South-west Australia.

The habit is that of the *Uninerves Spinescentes*; but the phyllodia are almost terete.
(See also 147. *A. subulata*, which has almost the phyllodia of the *Calamiformes*.)

Subseries 5. Brunioideæ. *Phyllodia parva, lineari-subulata* (*excepta* A. conferta), *verticillata v. conferta, obtusa v. innocue mucronata. Capitula globosa, ad axillas pedunculata.*

64. A. CEDROIDES, *Benth.! in Linnæa*, xxvi. 615. Rami villosuli. Phyllodia in verticillo plurima, lineari-subulata, tetragona, ½–1-pollicaria, rigidula, subpungentia. Pedunculi 2–4 lin. longi. Calyx obtuse lobatus. Petala lævia. Legumen curvum, 1½–2-pollicare, ad 2 lin. latum, valvis duris striatis, marginibus latis lævibus.—*Fl. Austral.* ii. 341.

Hab. South-west Australia.

65. A. LYCOPODIFOLIA, *A. Cunn.! in Hook. Ic. Pl.* t. 172. Rami villosuli. Phyllodia in verticillo plurima, subulata, 1–2 rarius 3 lin. longa, apice recurva, viscido-mucronata. Pedunculi phyllodio longiores. Calyx acute dentatus. Petala striata. Legumen sessile, planum, rectum v. curvum, 1–1½-pollicare, 2–3 lin. latum.—*Benth. Fl. Austral.* ii. 342.

A. asperulacea, F. Muell. ! in Journ. Linn. Soc. iii. 123.

Hab. Tropical Australia, north-west coast.

66. A. HIPPUROIDES, *Heward! Benth. in Hook. Lond. Journ.* i. 344. Pubescens. Phyllodia in verticillo plurima, tenuiter subulata, 5–6 lin. longa, recta. Pedunculi phyllodio longiores. Calyx dentatus. Petala striata. Legumen sessile *A. lycopodifoliæ*. —*Fl. Austral.* ii. 342.

Hab. Tropical Australia, north-west coast.

67. A. GALIOIDES, *Benth.! in Hook. Lond. Journ.* i. 344. Pubescens v. tomentosa. Phyllodia in verticillo plurima, tenuiter subulata, 2–5 lin. longa, vix striata, apice recurva, non viscida. Pedunculi phyllodio longiores. Calyx dentatus. Petala striata. Legumen stipite 2–3-lineari fultum.—*Fl. Austral.* ii. 342.

Hab. Tropical Australia, north coast.

68. A. BAUERI, *Benth. in Hook. Lond. Journ.* i. 344. Ramulis puberulis, cæterum glabra. Phyllodia in verticillo 5–7, lineari-subulata, 4–6 lin. longa, enervia, apice recurva. Pedunculi phyllodio sublongiores. Calyx acute dentatus. Petala costata nec striata. Legumen falcatum, utrinque angustatum, 1½–2 lin. latum, valvis duris striatis. —*Fl. Austral.* ii. 342.

Hab. Tropical Australia, north coast.

69. A. SUBTERNATA, *F. Muell.! in Journ. Linn. Soc.* iii. 124. Glabra. Phyllodia 2–3–4natim fasciculata, lineari-teretia v. subcompressa, 3–6 lin. longa, apice recurva. Pedunculi vix phyllodiis longiores. Sepala lineari-spathulata, basi connata. Petala tenuiter striata. Legumen longe stipitatum, planum, crassum, durum, marginibus crassis, valvis oblique striatis.—*Benth. Fl. Austral.* ii. 343.

Hab. Tropical Australia, north-west coast.

70. A. BRUNIOIDES, *A. Cunn.! in G. Don, Gen. Syst.* ii. 404. Glabra v. minute pubescens. Phyllodia conferta v. irregulariter verticillata, lineari-teretia, 2–4 lin. longa,

recte mucronata. Pedunculi phyllodio longiores. Calyx obtuse lobatus. Petala lævia, costata. Legumen ignotum.—*Benth. Fl. Austral.* ii. 343.

Hab. Subtropical East Australia.

71. A. CONFERTA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 345. Rami leviter puberuli. Phyllodia conferta v. irregulariter verticillata, linearia, compressa, 3–5 lin. longa, ½–1 lin. lata, enervia v. marginibus subnerviformibus. Pedunculi phyllodiis longiores. Sepala distincta, lineari-spathulata. Legumen stipitatum, planum, glaucum, 1–1½-pollicare, ad 5 lin. latum.—*Benth. Fl. Austral.* ii. 343.

Hab. Subtropical East Australia.

Subseries 6. Uninerves. *Phyllodia verticaliter compressa, nunc angusta obtusa v. breviter et oblique acuminata, nunc lata obtusa acuta v. rarius pungentia, costa centrali v. submarginali percursa, rarius 2-nervia. Capitula globosa, ad axillas pedunculata v. in racemos breves axillares disposita.*

A. Spinescentes. *Frutices rigidi, ramis apice spinescentibus. Phyllodia parva, sæpius angusta, nec pungentia nec margine glandulifera. Stipulæ sæpius minutæ v.* 0. *Pedunculi* 1*-cephali.*

72. A. SCABRA, *Benth.! in Linnæa*, xxvi. 605. Scabro-pubescens. Phyllodia linearioblonga, obliqua, obtusa v. apice recurva, semipollicaria, 1–2 lin. lata. Pedunculi phyllodio æquilongi. Calyx obtuse lobatus. Legumen immaturum planum, lineare, marginibus nerviformibus incrassatis.—*Benth. Fl. Austral.* ii. 344.

Hab. South-west Australia.

73. A. NODIFLORA, *Benth.! in Linnæa*, xxvi. 621. Subglabra. Phyllodia ad nodos fasciculata, linearia, obliqua, obtusa, rarius semipollicem excedentia, ad 1 lin. lata. Pedunculi phyllodio æquilongi. Sepala distincta, lineari-spathulata. Legumen ignotum. —*Fl. Austral.* ii. 344.

Hab. South-west Australia.

74. A. SPINOSISSIMA, *Benth.! in Linnæa*, xxvi. 621. Glabra. Phyllodia lineari-falcata, obtusa v. mucronulata, 2–3 lin. longa, infra lineam lata, obscure 1-nervia. Pedunculi phyllodio subæquilongi. Calyx truncatus. Legumen stipitatum, lineare, planum, 1½–2 lin. latum, marginibus nerviformibus.—*Fl. Austral.* ii. 344.

Hab. South-west Australia.

75. A. ULICINA, *Meissn. in Pl. Preiss.* ii. 202. Glabra. Phyllodia linearia, obtusa v. mucronulata, subpollicaria v. ramealia multo minora. Pedunculi breves. Calyx obtuse lobatus. Legumen lineare, flexuosum, 1–1½ lin. latum, inter semina contractum.—*Benth. Fl. Austral.* ii. 345.

Hab. South-west Australia.

76. A. ERINACEA, *Benth. in Hook. Lond. Journ.* i. 360. Glabra. Phyllodia oblique obovato-oblonga v. lanceolata, obtusa v. mucronulata, 3–5 lin. longa, 1–2 lin. lata, crassiuscula, obscure 1-nervia. Pedunculi 2–4 lin. longi. Calyx truncatus. Legumen ignotum.—*Fl. Austral.* ii. 345.

B. Armatæ. *Frutices suffruticesve ramis non spinescentibus v. rarius hinc inde indurato-subspinescentibus. Phyllodia ex obovato lanceolata, brevia v. rarius sesquipollicaria, undulata, costa subcentrali, glandula marginali minuta v.* 0. *Stipulæ sæpius setaceo-subulatæ v. aciculares, persistentes, rarius phyllodineæ. Pedunculi* 1*-cephali.*

* *Calyx minimus v.* 0.

77. A. HUEGELII, *Benth. ! in Hueg. Enum.* 42. Hirsuta. Phyllodia falcato-semiovata, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria, 2–5 lin. lata, pungenti-mucronata. Stipulæ setaceo-spinescentes. Petala hirsuta. Legumen lineare, falcatum, pollicare, 2 lin. latum, marginibus nerviformibus.—*Hueg. Bot. Archiv*, t. 10; *Benth. Fl. Austral.* ii. 345.

Hab. South-west Australia.

78. A. NERVOSA, *DC. Mém. Lég.* 444. Glabra. Rami acutanguli. Phyllodia late lanceolata, falcata, mucronato-acuta, 1–$1\frac{1}{2}$-pollicaria. Capitula pauciflora. Petala 4, glabra. Legumen ignotum.—*Field et Gardn. Sert. Pl.* t. 4; *Benth. Fl. Austral.* ii. 346.

Hab. South-west Australia.

79. A. OBOVATA, *Benth.! in Hook. Lond. Journ.* i. 329. Scabro-pubescens. Rami angulato-striati. Phyllodia inferiora obovata, obtusa, 1–$1\frac{1}{2}$-pollicaria, superiora late falcata, acuta v. pungentia, omnia costa marginibusque nerviformibus prominentibus pennivenia. Capitula pauciflora. Petala 4, glabra. Legumen ignotum.—*Fl. Austral.* ii. 346.

Hab. South-west Australia.

** *Calyx dimidium corollæ æquans v. superans. Petala* 5, *glabra.*

80. A. CONGESTA, *Benth. ! in Hook. Lond. Journ.* i. 327. Glabra. Rami spinescentes. Phyllodia oblique ovali-oblonga v. falcato-lanceolata, obtusa v. acuta, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria. Stipulæ breves, subspinescentes. Sepala distincta, lineari-spathulata. Legumen lineare, curvum, crassiusculum, inter semina contractum.—*Fl. Austral.* ii. 346.

A. Baxteri, Meissn. ! in Pl. Preiss. i. 7, non Benth.

Hab. South-west Australia.

81. A. DERMATOPHYLLA, *Benth. ! Fl. Austral.* ii. 346. Glabra. Phyllodia oblongo-cuneata, subfalcata, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria, rigida, crassa. Stipulæ subulatæ, spinescentes. Sepala subdistincta, lineari-spathulata. Legumen ignotum.

Hab. South-west Australia.

82. A. ASPERA, *Lindl. ! in Mitch. Three Exped.* ii. 139. Scabro-pubescens et viscida. Phyllodia oblique oblongo-linearia v. anguste falcata, $\frac{1}{2}$–1-pollicaria, v. rarius longiora. Stipulæ parvæ, setaceæ. Sepala spathulata, plus minus connata. Legumen lineare, curvum, glanduloso-hispidum, 1–2-pollicare, ad 2 lin. longum, inter semina contractum.—*Benth. Fl. Austral.* ii. 347.

A. Ausfeldi, Regel, Gartenfl. xvi. 225, t. 550, ex ic. et descr.

A. erythrocephala, A. Cunn. ! Benth. in Hook. Lond. Journ. i. 362, phyllodiis angustis.

A. strigosa, Lindl. ! in Mitch. Three Exped. ii. 185, non Link (phyllodiis latioribus).

A. densifolia, Benth. in Hook. Lond. Journ. i. 360.

Hab. Extratropical Australia: barren interior of the eastern colonies.

83. A. ARMATA, *R. Br.! in Ait. Hort. Kew.* ed. 3, v. 463. Pubescenti-hirta v. glabrata. Phyllodia oblique oblonga v. falcato-lanceolata, sæpius obtusa, $\frac{3}{4}$–1-pollicaria, valde undulata. Stipulæ subulatæ, spinescentes. Calyx obtuse lobatus. Legumen rectum v. curvum, $1\frac{1}{2}$–2-pollicare, 2–3 lin. latum, continuum, molliter villosum hispidum v. rarius glabratum. *Bonpl. Jard. Malm.* t. 55; *Bot. Mag.* t. 1653; *Lodd. Bot. Cab.* t. 49; *Benth. Fl. Austral.* ii. 347.

A. furcifera, Lindl.! in Mitch. Three Exped. ii. 267.

Hab. Extratropical Australia: interior of the eastern colonies extending westward to Murchison River, but wanting probably in the extreme south-west, the real station of Baxter's specimen marked King George's Sound being very doubtful.

The following forms, with longer and narrower phyllodia, are mostly, and perhaps all, of garden origin, and most of them probably hybrids between *A. armata* and other cultivated species.

A. paradoxa, DC. Cat. Hort. Monsp. 74; Prod. ii. 449.

A. undulata, Willd. Enum. Hort. Berol. Suppl. 68; Wendl. Comm. Acac. t. 3; Bot. Reg. t. 843; Lodd. Bot. Cab. t. 753; Reichb. Ic. et Descr. Pl. t. 89.

A. ornithophora, Sweet, Fl. Austral. t. 24; Lodd. Bot. Cab. t. 1469.

A. hybrida, Lodd. Bot. Cab. t. 1342.

A. micracantha, Dietr. in Allgem. Gart. Zeit. i. 83.

A. tristis, Grah.! in Bot. Mag. t. 3420.

84. A. IDIOMORPHA, *A. Cunn.! Benth.! in Hook. Lond. Journ.* i. 329. Molliter villosa. Rami sæpe spinescentes. Phyllodia late et oblique ovata, mucronato-pungentia, semipollicaria. Stipulæ spinescentes, recurvæ. Legumen ignotum.—*Benth. Fl. Austral.* ii. 348.

Hab. South-west Australia: Dirk Hartog's Island.

**** Calyx dimidium corollæ æquans v. superans. Petala 5, hirsuta.*

85. A. SHUTTLEWORTHII, *Meissn.! in Pl. Preiss.* i. 7. Hirsuta. Phyllodia oblique lateque ovata v. orbiculata, crassa, basi obtusa, $\frac{1}{4}$–$\frac{1}{2}$-pollicaria. Stipulæ minimæ, interdum spinescentes. Pedunculi brevissimi. Calyx lobatus. Legumen crasso-coriaceum, scabro-pubescens, orbiculare v. oblongum, ad 3 lin. latum, 1–2-spermum.—*Benth. Fl. Austral.* ii. 348.

Hab. South-west Australia.

86. A. GREGORII, *F. Muell.! Fragm. Phytogr. Austral.* iii. 47. Molliter pubescens. Phyllodia obovata v. oblonga, basi contracta, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria. Stipulæ parvæ, e lata basi acuminatæ, persistentes. Calyx lobatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 348.

Hab. Tropical Australia: north-west coast.

87. A. PILOSA, *Benth! in Linnæa,* xxvi. 607. Hirsuta. Phyllodia oblique obovata v. late oblonga, basi contracta, $\frac{1}{2}$–1-pollicaria. Stipulæ setaceæ, subspinescentes. Calyx lobatus. Legumen junius oblongum, hispidum, planum, oligospermum.—*Fl. Austral.* ii. 348.

Hab. South-west Australia.

88. A. CRISPULA, *Benth.! in Linnæa,* xxvi. 606. Hirsuta. Phyllodia falcato-oblonga, obtusa, semipollicaria, 1–$1\frac{1}{2}$ lin. lata, basi contracta, crassiuscula. Stipulæ setaceæ v. spinescentes. Calyx lobatus. Legumen ignotum.—*Fl. Austral.* ii. 349.

Hab. South-west Australia.

89. A. CRASSISTIPULA, *Benth.! in Hook. Lond. Journ.* i. 326. Hirsuta. Phyllodia oblongo-linearia, falcata, apice incurva v. uncinata, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria. Stipulæ phyllodiis conformes nisi minores. Calyx breviter lobatus. Legumen ignotum.—*Fl. Austral.* ii. 349.

Hab. South-west Australia.

This species is remarkable for its stipules. In other respects the last four species are very closely allied to each other.

C. Triangulares. *Frutices rigidi interdum spinescentes. Phyllodia parva, rigida, costa sæpius margini inferiori approximata, margine superiore rotundato v. angulato ad angulum sæpissime glandulifero. Stipulæ variant spinescentes subulatæ v. minutæ. Pedunculi* 1-*cephali.*

* *Phyllodia pungenti-acuminata, margine superiore infra medium angulato.*

90. A. HASTULATA, *Sm.! in Rees Cycl.* xxxix. *Suppl.* Rami pubescentes v. glabrati. Phyllodia hastato-lanceolata, 2–3 lin. longa, costa subcentrali. Stipulæ setaceæ. Flores in capitulo 3–5 (sæpius 4), 4-meri, glabri. Legumen lineare, subteres, striatum, 1–2-pollicare, vix linea latius, glabrum v. pilosulum.—*Bot. Mag.* t. 3341; *Benth. Fl. Austral.* ii. 349.

Hab. South-west Australia.

91. A. HORRIDULA, *Meissn.! in Pl. Preiss.* i. 9. Pubescens. Phyllodia oblique ovato-lanceolata v. lanceolata, 3–4 lin. longa, costa subcentrali. Stipulæ setaceæ. Flores in capitulo 3–5 (sæpius 4), 4-meri, dense villosi. Legumen junius pubescens.—*Benth. Fl. Austral.* ii. 350.

Hab. South-west Australia.

92. A. DIVERGENS, *Benth.! in Hook. Lond. Journ.* i. 331. Glabra v. pubescens. Phyllodia triangularia v. 2-loba, 2–4 lin. longa, costa margini inferiori approximata. Flores in capitulo 8–12, 4-meri, glabri. Legumen ignotum.—*Benth. Fl. Austral.* ii. 350.

Hab. South-west Australia.

93. A. VOMERIFORMIS, *A. Cunn.! Benth.! in Hook. Lond. Journ.* i. 332. Glabra v. pubescens. Phyllodia oblique lanceolata v. late triangularia v. 2-loba, 2–4 lin. longa, costa margini inferiori contigua. Flores in capitulo numerosi, sæpius 5-meri, glabri. Legumen lineare, planum, glabrum, ad 2 lin. latum, inter semina contractum.—*Dietr. Fl. Univers.* t. 82; *Benth. Fl. Austral.* ii. 350.

A. Gunnii, Benth. in Hook. Lond. Journ. i. 332; Hook. f. Fl. Tasm. t. 18.

Hab. Extratropical East Australia and Tasmania.

** *Phyllodia truncato-triangularia v. trapezoidea, costa sæpius excentrica in mucronem parvum producta, margine superiore supra medium angulato sæpiusque glandulifero.*

94. A. BIFLORA, *R. Br.! in Ait. Hort. Kew.* ed. 3, v. 463. Pubescens v. rarius glabra. Phyllodia triangularia, 3–4, rarius 6 lin. longa, costa margini inferiori approximata. Flores in capitulo 2, rarius 3–4, 4-meri. Legumen subsemipollicare, $1\frac{1}{2}$–2 lin. latum,

utrinque angustatum, marginibus incrassato-nerviformibus.—*Wendl. Comm. Acac.* t. 2; *Reichb. Ic. et Descr. Pl.* t. 12; *Benth. Fl. Austral.* ii. 351.

A. triangularis, Benth.! in Hueg. Enum. 42.

Hab. South-west Australia.

95. A. DECIPIENS, *R. Br.! in Ait. Hort. Kew.*, ed. 3, v. 463. Glabra v. parce hirsuta. Phyllodia triangularia v. subtrapezoidea, 4–8 lin. longa et apice vix longitudine angustiora, costa margini inferiori approximata. Flores in capitulo 6–10, 4-meri. Legumen incurvum, crassum, durum, 1–2-pollicare, 1–1½ lin. latum, acuminatum, basi contractum. *Bot. Mag.* t. 1745, 3244; *Reichb. Ic. et Descr. Pl.* t. 12, 88; *Benth. Fl. Austral.* ii. 351.

Mimosa decipiens, Kön. in Sims Ann. Bot. i. 366, t. 8.

Acacia dolabriformis, Colla! Hort. Ripul. 1.

A. incrasssata, Hook.! Ic. Pl. t. 370.

A. biflora, Paxt. Mag. ix. 221, cum ic. non Br.

Hab. South-west Australia.

96. A. CUNEATA, *Benth.! in Hueg. Enum.* 42. Glabra v. laxe hirsuta. Phyllodia oblongo-cuneata, ½–1-pollicaria, apice truncata et multo angustiora quam longa, costa parum excentrica. Flores in capitulo 8–15, plerique 4-meri. Legumen curvum, hirsutum, 2–3-pollicare, ad 2 lin. latum, marginibus incrassatis.—*Benth. Fl. Austral.* ii. 351.

Hab. South-west Australia.

97. A. DILATATA, *Benth.! in Linnæa*, xxvi. 608. Molliter pubescens. Phyllodia late triangulari-cuneata, ½–¾-pollicaria, costa margini inferiori approximata, angulo marginis superioris obtuso sæpius eglanduloso. Flores in capitulo ad 20, 5-meri, hispiduli. Calyx anguste lobatus. Legumen ignotum.—*Fl. Austral.* ii. 352.

Hab. South-west Australia.

98. A. BIDENTATA, *Benth.! in Hook. Lond. Journ.* i. 333. Rami pubescentes v. rarius glabrati, interdum spinescentes. Phyllodia obovata v. cuneato-oblonga, 2–4 v. rarius 6 lin. longa, costa margini inferiori approximata, angulo marginis superioris rotundato v. rarius acuto, apicem phyllodii sæpe excedente. Flores in capitulo 8–15, glabri, 4–5-meri. Calyx minimus. Legumen valde curvum v. tortum, lineare, 1–1½ lin. latum.—*Fl. Austral.* ii. 352.

Hab. South-west Australia.

99. A. ACANTHOCLADA, *F. Muell.! Fragm. Phytogr. Austral.* iii. 127. Pubescens v. glabrata, ramis sæpe spinescentibus. Phyllodia anguste cuneata, 2–4 lin. longa, costa margini inferiori approximata, angulo marginis superioris rotundato. Flores in capitulo 8–15, glabri. Calyx minimus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 352.

Hab. South and South-west Australia; perhaps only a narrow-leaved variety of *A. bidentata.*

(See also the first three species of the following *Brevifoliæ,* which sometimes resemble some of the preceding, but are readily known by their distinct spathulate sepals.)

D. Brevifoliæ. *Frutices non spinescentes. Phyllodia nunc late ovata v. falcata, nunc anguste oblonga v. linearia, pleraque pollice breviora, obtusa v. imocue mucronata, v. rarius undulata et acutiora. Stipulæ minutæ v.* 0. *Pedunculi* 1-*cephali.*

* *Sepala distincta, lineari-spathulata.*

100. A. OBLIQUA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 334. Glabra v. leviter pubescens. Ramuli subteretes. Phyllodia oblique obovata v. orbiculata, $\frac{1}{4}$–$\frac{1}{2}$-pollicaria, minute recurvo-mucronata, costa margini inferiori approximata. Capitula 8–15-flora. Legumen lineare, tortum, $1\frac{1}{2}$–2 lin. latum.—*Benth. Fl. Austral.* ii. 353.

A. cyclophylla, Schlecht.! in Linnæa, xx. 663.

A. rotundifolia, Hook.! Bot. Mag. t. 4041; Paxt. Mag. v. 123, cum ic.

Hab. Extratropical East Australia: desert interior.

101. A. ACINACEA, *Lindl.! in Mitch. Three Exped.* ii. 267. Glabra. Ramuli subteretes. Phyllodia oblique oblonga v. subfalcata, rarius semipollicem excedentia, minute recurvo-mucronata, costa parum excentrica. Capitula 1–20-flora. Legumen lineare, curvum v. tortum, $1\frac{1}{2}$–2 lin. latum.—*Benth. Fl. Austral.* ii. 353.

A. Latrobei, Meissn.! in Pl. Preiss. i. 10.

Hab. South and South-east Australia.

102. A. LINEATA, *A. Cunn.! in G. Don, Gen. Syst. ii.* 403. Rami subteretes, pubescentes v. villosi. Phyllodia linearia, mucrone parvo recurvo, semipollicaria v. paullo longiora, costa margini inferiori approximata. Capitula 10–15-flora. Legumen lineare, curvum v. tortum, $1\frac{1}{2}$–2 lin. latum.—*Bot. Mag.* t. 3346; *Benth. Fl. Austral.* ii. 353.

A. runciformis, A. Cunn.! in G. Don, Gen. Syst. ii. 404.

A. dasyphylla, A. Cunn.!; Benth. in Hook. Lond. Journ. i. 359.

A. imbricata, F. Muell.! Fragm. Phytogr. Austral. i. 5, ii. 177.

Hab. Extratropical East Australia: desert interior.

103. A. TRIQUETRA, *Benth.! in Hook. Lond. Journ.* i. 358. Glabra. Rami acutanguli. Phyllodia linearia, pleraque pollice breviora, costa subcentrali. Flores in capitulo numerosi, parvi. Legumen curvum, 2–3-pollicare, $1\frac{1}{4}$ lin. latum, marginibus incrassatis.—*Benth. Fl. Austral.* ii. 354.

A. Meissneri, var. *angustifolia,* Meissn.! in Pl. Preiss. i. 13.

Hab. South-west Australia.

104. A. LIGUSTRINA, *Meissn.! in Pl. Preiss.* ii. 203. Glabra. Rami acutanguli. Phyllodia oblique lanceolata, sæpe pollicem excedentia, apice basique contracta, costa parum excentrica. Flores in capitulo numerosi, parvi. Legumen ignotum.—*Benth. Fl. Austral.* ii. 354.

Hab. South-west Australia.

105. A. MEISSNERI, *Lehm.! Del. Sem. Hort. Hamb.* 1842. Glabra, sæpeque glauca. Ramuli acutanguli. Phyllodia oblique obovato-oblonga v. subcuneata, $\frac{1}{2}$–1-pollicaria, coriacea, costa subcentrali, marginibus non incrassatis. Legumen elongatum, 3–4 lin. latum, planum, marginibus tenuibus.—*Benth. Fl. Austral.* ii. 354.

Hab. South-west Australia.

(See also 71. *A. conferta.*)

** *Sepala* (*excepta* A. dura) *in calycem dentatum coalita.*

106. A. ANCEPS, *DC.! Mém. Lég.* 446. Glabra sæpeque glauca. Rami acutanguli. Phyllodia late ovata v. oblonga, lata basi affixa et semiarticulata, subdecurrentia, 1½–2-pollicaria, rigida, costa subcentrali. Flores in capitulo numerosi. Legumen stipitatum, rectum, planum, ad 1½ poll. longum, ½ poll. latum.—*Benth. Fl. Austral.* ii. 355.

A. Muelleri, Benth.! in Linnæa, xxvi. 603.

Hab. South Australia.

107. A. HISPIDULA, *Willd. Spec.* iv. 1054. Scabro-hispidula. Phyllodia late falcata, ½–¾-pollicaria, 2–3 lin. lata, apice basique acuta, costa subcentrali, marginibus nerviformibus scabro-subdenticulatis. Legumen ovatum 1-spermum, v. oblongum 2-spermum, 4 lin. latum; crasso-coriaceum, marginibus non elevatis.—*Hook. Ic. Pl.* t. 161; *Lodd. Bot. Cab.* t. 823; *Benth. Fl. Austral.* ii. 355.

Mimosa hispidula, Sm.! Bot. Nov. Holl. 59, t. 16.

Hab. Extratropical East Australia.

108. A. UNDULIFOLIA, *A. Cunn.! in G. Don, Gen. Syst.* ii. 404. Glabra pubescens v. hirsuta, ramulis floridis elongatis pendulis. Phyllodia ovata v. suborbicularia, subpetiolata, subsemipollicaria, rarius dimidio minora v. majora, coriacea, costa subcentrali pennivenïa, marginibus nerviformibus. Legumen vix stipitatum, longiusculum, 7–9 lin. latum, planum, margine nerviformi.—*Bot. Mag.* t. 3394; *Lodd. Bot. Cab.* t. 1544; *Lemaire, Jard. Fleur.* t. 282; *Benth. Fl. Austral.* ii. 355.

A. uncinata, Lodd.; Lindl. Bot. Reg. t. 1332.

A. piligera, A. Cunn.! in Bot. Mag. sub n. 3394.

A. setigera, A. Cunn.! in Hook. Ic. Pl. t. 166.

A. sertiformis, A. Cunn.! in Bot. Mag. sub n. 3394: Hook. Ic. Pl. t. 159.

A. dysophylla, Benth.! in Hook. Lond. Journ. i. 346.

A. plagiophylla, F. Muell. in Journ. Linn. Soc. iii. 131?

Hab. Extratropical East Australia.

109. A. FLEXIFOLIA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 359. Minute canotomentella. Phyllodia linearia, obtusa, ½–¾-pollicaria, infra medium sæpius inflexa et impresso-glandulifera, costa margini inferiori approximata. Flores in capitulo 6–10. parvi. Calyx breviter lobatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 356.

Hab. Extratropical East Australia.

110. A. DURA, *Benth.! in Linnæa,* xxvi. 622. Glabra. Phyllodia linearia v. linearicuneata, obtusa, ¾-pollicaria v. paullo longiora, infra medium sæpius inflexa et impresso-glandulifera, costa prominula. Flores in capitulo 6–10. Sepala distincta, spathulata. Legumen ignotum.—*Benth. Fl. Austral.* ii. 356.

Hab. South-west Australia.

111. A. SPATHULATA, *F. Muell.! Benth. Fl. Austral.* ii. 356. Glabra v. leviter pubescens. Phyllodia lineari-cuneata v. oblongo-spathulata, 4–8 lin. longa, obtusissima, crassa, enervia. Flores in capitulo numerosa. Legumen oblongo-lineare, planum, crassum, durum, 1–1½-pollicare, 2–3 lin. latum.

Hab. Tropical and extratropical West Australia.

(See also 113. *A. montana,* and some varieties of 155. *A. brachybotrya.*)

E. Angustifoliæ. *Frutices v. arbores non spinescentes. Phyllodia oblongo-lanceolata v. linearia, interdum falcata, costa subcentrali v. rarius binervia, pollice plerumque longiora et interdum pluripollicaria. Stipulæ minutæ v.* 0, *v. rarius* (*in* A. Sentis *et* A. dentifera) *breviter subulato-spinescentes. Pedunculi* 1-*cephali.*

* *Pedunculi brevissimi, rarius* $\frac{1}{4}$ *poll. excedentes.*

112. A. MICROCARPA, *F. Muell.! Fragm. Phytogr. Austral.* i. 6. Glabra v. partes novellæ sericeo-argenteæ v. aureæ. Phyllodia oblongo-linearia v. lineari-lanceolata, 1–1$\frac{1}{2}$-rarius 2-pollicaria, lævia, costa vix prominula. Capitula multiflora. Sepala anguste lineari-spathulata, distincta. Legumen lineare, curvum v. tortum, 2–3-pollicare, vix 1$\frac{1}{2}$ lin. latum, inter semina contractum.—*Benth. Fl. Anstral.* ii. 357.

Hab. Extratropical East Australia, desert interior.

113. A. MONTANA, *Benth.! in Hook. Lond. Journ.* i. 360. Resinoso-viscosa, ramis pubescentibus. Phyllodia oblonga v. late linearia, obtusa, nunc 1–1$\frac{1}{2}$-pollicaria et 2–3 lin. lata, nunc multo minora, sæpissime 2-nervia. Capitula multiflora. Sepala in calycem lobatum sæpius connata. Legumen dense tomentosum, 1–2-pollicare, ad 2 lin. latum, inter semina continuum.—*Fl. Austral.* ii. 357.

A. clavata, Schlecht.! in Linnæa, xx. 662.

Hab. Extratropical East Australia, desert interior.

114. A. VERNICIFLUA, *A. Cunn.! in Field, New S. Wales.* 344. Resinoso-viscosa, glabra. Phyllodia oblonga v. lineari-lanceolata, sæpius falcata et acuta, 2–4-pollicaria, 2-nervia v. rarius 1-nervia. Capitula multiflora. Calyx breviter lobatus. Legumen lineare, pubescens, 2–3 lin. latum.—*Bot. Mag.* t. 3266; *Benth. Fl. Austral.* ii. 358.

A. graveolens, A. Cunn.! in G. Don, Gen. Syst. ii. 404; Bot. Mag. t. 3279; Lodd. Bot. Cab. t. 1460.

A. virgata, Lodd. Bot. Cab. t. 1246.

A. exudans, Lindl.! in Mitch. Three Exped. ii. 214; Dietr. Fl. Univ. t. 83 (phyllodiis latioribus).

Hab. Extratropical East Australia and Tasmania.

115. A. LEPROSA, *Sieb.! in DC. Prod.* ii. 450. Viscidula, cæterum glabra. Phyllodia lineari-lanceolata, basi contracta, 1$\frac{1}{2}$–3-pollicaria, costa subcentrali, venulis tenuissimis. Capitula multiflora. Calyx breviter lobatus. Legumen falcatum v. rarius rectum, lineare, 2–2$\frac{1}{2}$ lin. latum.—*Bot. Reg.* t. 1441 (*ic. subdubia*).—*Benth. Fl. Austral.* ii. 358.

A. reclinata, F. Muell.! First Gen. Rep. 12.

Hab. Extratropical East Australia.

116. A. STRICTA, *Willd. Spec.* iv. 1052. Glabra, vix viscosa. Phyllodia linearia, obtusa, 2–4- v. interdum 5-pollicaria, 2–5 lin. lata, coriacea, costa subcentrali, reticulato-pennivenia. Capitula multiflora. Calyx obtuse lobatus. Legumen elongatum, 1$\frac{1}{2}$–2$\frac{1}{2}$ lin. latum, inter semina continuum.—*Reichb. Ic. et Descr. Pl.* t. 90 (*venatione neglecta*); *Lodd. Bot. Cab.* t. 99?; *Benth. Fl. Austral.* ii. 358.

Mimosa stricta, Andr. Bot. Rep. i. 53; Bot. Mag. t. 1121.

Acacia emarginata, Wendl. Comm. Acac. 27.

Hab. Extratropical East Australia and Tasmania.

** *Pedunculi plerique subsemipollicares v. longiores.*

117. A. DODONÆIFOLIA, *Willd.! Enum. Hort. Berol. Suppl.* 68. Resinoso-viscosa, cæterum glabra. Phyllodia oblongo-linearia v. lanceolata, 2–4-pollicaria, costa subcentrali, venulis reticulatis paucis prominulis. Capitula multiflora. Calycis lobi breves, crassi. Legumen elongatum, subplanum, rectum v. falcatum, ad $2\frac{1}{2}$ lin. latum.—*Reichb. Ic. et Descr. Pl.* t. 91; *Colla, Hort. Ripul.* t. 27; *Benth. Fl. Austral.* ii. 359.

Mimosa dodonæifolia, Pers. Syn. ii. 261.

Acacia viscosa, Schrad. in Wendl. Diss. Acac. 30, t. 7.

A. visciflua, F. Muell.! Pl. Vict. ii. 24.

Hab. South Australia.

118. A. GNIDIUM, *Benth.! Fl. Austral.* ii. 359. Glabra, innovationibus glutinosis. Phyllodia anguste linearia, 1–2-pollicaria, ad 1 lin. lata, costa parum prominula, venulis obscuris interdum costæ subparallelis. Flores in capitulo 15–20. Calyx breviter lobatus. Legumen ignotum.

Hab. Subtropical East Australia.

119. A. RAMOSISSIMA, *Benth.! in Hook. Lond. Journ.* i. 356 pro parte. Ramuli pubescentes. Phyllodia linearia, 1–$1\frac{1}{2}$-pollicaria, ad 1 lin. lata, crassiuscula, obscure uninervia. Flores ignoti. Legumen lineare, rectum, planum, crasse coriaceum, 1–$1\frac{1}{2}$-pollicare, 2 lin. latum, inter semina transverse depressum nec contractum.—*Benth. Fl. Austral.* ii. 360.

Hab. South-west Australia.

The foliage is nearly that of *A. pycnophylla* and *A. Harveyi*; but the fruit is very different.

120. A. SENTIS, *F. Muell.! in Journ. Linn. Soc.* iii. 128. Glabra v. primum puberula. Phyllodia lanceolato-oblonga v. linearia, falcata v. curvula, nunc $\frac{3}{4}$-pollicaria et 2–3 lin. lata, nunc 2-pollicaria et 1 lin. lata, 1-nervia, pennivenia. Stipulæ subulato-spinescentes v. 0. Capitula multiflora. Sepala distincta, spathulata. Legumen planum, tenue, pollicare v. longius, $\frac{1}{2}$–$\frac{3}{4}$ poll. latum.—*Benth. Fl. Austral.* ii. 360.

A. Victoriæ, Benth.! in Mitch. Trop. Austr. 333.

Hab. Tropical and Extratropical North Central and Eastern Australia: desert interior.

121. A. DENTIFERA, *Benth.! in Maund, Botanist,* iv. t. 179. Glabra. Phyllodia anguste linearia, 3–8-pollicaria, 1–2 lin. lata, costa prominula, venulis obscuris. Stipulæ dentiformes persistentes v. 0. Capitula densa, sæpe phyllodiis floralibus abortientibus subracemosa. Sepala distincta, angusta. Legumen 2–3-pollicare, ad 3 lin. latum, inter semina continuum.—*Fl. Austral.* ii. 360.

Hab. South-west Australia.

A. longifolia, Paxt. Mag. xii. 269, or *A. dentifera,* Bot. Mag. t. 4032, is a garden variety, with more falcate phyllodia and racemose flower-heads.

122. A. FASCICULIFERA, *F. Muell.! Benth. Fl. Austral.* ii. 361. Glabra. Phyllodia lanceolato-falcata, 4–6-pollicaria, coriacea, costa marginibusque nerviformibus prominentibus, venulis inconspicuis. Pedunculi fasciculati, $\frac{1}{2}$–1-pollicares. Flores numerosi. Sepala distincta, lineari-spathulata. Legumen ignotum.

Hab. Subtropical East Australia.

(See also 138. *A. salicina,* in which the racemes are sometimes reduced to a single head.)

F. Racemosæ. *Frutices v. arbores inermes. Phyllodia mutica v. rarius pungentia, præter costam centralem prominentem pennivenia v. subavenia. Capitula globosa ad axillas racemosa v. rarius hinc inde solitaria. Flores excepta* A. myrtifolia *parvi, 5-meri, in capitulo sæpius numerosi.*

The species of this group are amongst the most difficult to circumscribe within definite limits.

* *Phyllodia sæpius elongata, falcato-lanceolata v. fere linearia apice basique contracta, pennivenia. Calyx corolla subdimidio brevior.*

123. A. FALCATA, *Willd. Spec.* iv. 1053. Glabra. Phyllodia falcato-lanceolata, acuminata, basi contracta; 3–6-pollicaria v. longiora, margine superiore eglanduloso v. ima basi obscure glanduloso. Capitula parva. Sepala distincta. Legumen planum, 2–3-pollicare, ad 3 lin. latum.—*Wendl. Comm. Acac.* t. 14; *Lodd. Bot. Cab.* t. 1115; *Benth. Fl. Austral.* ii. 361.

Mimosa falcata, Poir. Dict. Suppl. i. 61.

M. obliqua, Wendl. Bot. Beob. 57.

Acacia plagiophylla, Spreng. Syst. iii. 135.

Hab. Extratropical East Australia.

124. A. MACRADENIA, *Benth.! in Mitch. Trop. Austr.* 360. Glabra. Phyllodia falcato-lanceolato, acuminata, basi contracta, $\frac{1}{2}$–1-pedalia, marginibus incrassatis, superiore basi glandulifero v. eglanduloso, venulis transversis. Capitula parva. Calyx breviter lobatus. Legumen elongatum, planum, 5–6 lin. latum.—*Fl. Austral.* ii. 362.

Hab. Subtropical East Australia.

125. A. PENNINERVIS, *Sieb.! in DC. Prod.* ii. 452. Glabra. Phyllodia oblongo- v. lanceolato-falcata, acuminata, basi contracta, 3–4-pollicaria v. interdum multo longiora, venulis obliquis, margine superiore sæpius supra medium glandulifero. Capitula parva. Calyx truncatus v. breviter dentatus. Legumen planum, sæpe 4–5 poll. longum, 5–6 lin. latum.—*Bot. Mag.* t. 2754; *Benth. Fl. Austral.* ii. 362.

A. impressa, Lindl.! Bot. Reg. t. 1115; Lodd. Bot. Cab. t. 1319.

Var. FALCIFORMIS, partibus novellis minute cano- v. aureo-pubescentibus, phyllodiis semipedalibus v. longioribus, legumine $\frac{3}{4}$ lin. lato.

A. falciformis, DC. Prod. ii. 452.

A. astringens, A. Cunn.! in G. Don, Syst. ii. 405.

Hab. Extratropical East Australia and Tasmania.

126. A. RETINODES, *Schlecht.! in Linnæa,* xx. 664. Glabra. Phyllodia lineari-lanceolata, falcata, basi contracta, 3–5-pollicaria, margine superiore supra basin glandulifero. Flores in capitulo vix 20. Calyx brevissime lobatus. Legumen breviter stipitatum, subplanum, 3–8-pollicare, 3–4 lin. latum.—*Benth. Fl. Austral.* ii. 362.

Hab. South and South-east Australia.

127. A. NERIIFOLIA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 357. Partes novellæ glaucæ v. farinoso-tomentosæ, demum glabrescentes. Phyllodia lineari-lanceolata, subfoliata, basi contracta, 3–5-pollicaria, glandula marginali minuta v. 0. Capitula multiflora, parva. Sepala distincta v. vix basi connata. Legumen subrectum, planum, pluripollicare, ad 4 lin. latum.—*Fl. Austral.* ii. 363.

A. iteaphylla, F. Muell.! Benth. in Linnæa, xxvi. 617.

Hab. Extratropical East Australia.

128. A. MICROBOTRYA, *Benth.! in Hook. Lond. Journ.* i. 353. Glabra. Phyllodia lanceolato-falcata, acuta, basi contracta, 3–5-pollicaria, glandulis marginalibus 1–2 parvis v. 0. Capitula parva, multiflora. Calyx breviter lobatus, sepalis vix demum solvendis. Legumen (si rite huc adscriptum) anguste lineare.—*Fl. Austral.* ii. 363.

A. myriobotrya et *A. leiophylla*, var. *microcephala*, Meissn.! in Pl. Preiss. i. 15.

A. subfalcata et *A. daphnifolia*, Meissn.! in Bot. Zeit. 1855. 11.

A. rostellifera, Seem.! Eingef. Acac. t. 2.

A. pterigoidea, Seem. in Verhandl. Gartenb.-Gesellsch. 1846, 11, ex Seem. Eingef. Acac. 33.

Hab. South-west Australia.

129. A. SALIGNA, *Wendl. Comm. Acac.* 26. Glabra. Phyllodia falcato-lanceolata, obtusiuscula, basi contracta, pluripollicaria, costa marginibusque nerviformibus prominulis, venulis obscuris, glandula marginali a basi distante v. 0. Capitula majuscula. Calyx sinuato-truncatus. Legumen planum, sæpius rectum et 5–6-pollicare, vix 3 lin. latum.—*Benth. Fl. Austral.* ii. 364.

Mimosa saligna, Labill.! Pl. Nov. Holl. ii. 86. t. 235.

Acacia leiophylla, Benth.! in Hook. Lond. Journ. i. 351.

A. Blomei, Ohlend. ex Seem. Eingef. Acac. 30.

Hab. South-west Australia.

130. A. CYANOPHYLLA, *Lindl.! Bot. Reg.* 1839, *Misc.* 45. Glabra, sæpius glauca. Phyllodia lineari-oblonga v. lanceolato-falcata, ½–1-pedalia v. inferiora longiora, basi longe contracta, costa marginibusque nerviformibus prominulis, distincte pennivenia. Capitula majuscula. Calyx lobatus. Legumen pluripollicare, ad 2½ lin. latum.—*Benth. Fl. Austral.* ii. 364.

Hab. South-west Australia.

(See also 121. *A. dentifera*, and 174. *A. bivenosa*.)

** *Phyllodia elongata falcato-lanceolata v. linearia. Capitula majuscula, densiflora. Calyx corolla vix triente brevior.*

131. A. PYCNANTHA, *Benth.! in Hook. Lond. Journ.* i. 351. Glabra. Phyllodia lanceolato-falcata, basi longe contracta, 3–6-pollicaria, medio sæpe pollicem lata, pennivenia, glandula marginali prope basin majuscula. Calyx breviter lobatus. Legumen planum, tenue, pluripollicare, ad 3 lin. latum. Semina longitudinalia.—*Fl. Austral.* ii. 365; *Dietr. Fl. Univ.* t. 86.

A. petiolaris, Lehm.! Nov. Hort. Hamb. in Linnæa, xxv. 306.

A. falcinella, Meissn.! in Bot. Zeit. 1855, 11.

Hab. South and South-east Australia.

132. A. NOTABILIS, *F. Muell.! Fragm.* i. 6. Glabra, sæpeque glauca. Phyllodia lanceolato-falcata v. fere linearia, basi contracta, 4–8-pollicaria, crasse coriacea, costa marginibusque nerviformibus crassis, venulis obscuris. Calyx breviter lobatus. Legumen planum, glaucum, 1½–3-pollicare, 4–5 lin. latum, subcoriaceum. Semina transversa.—*Benth. Fl. Austral.* ii. 365.

Hab. Extratropical East Australia: desert interior.

*** *Phyllodia recta v. falcata, pluri- v. rarius* 1½*-pollicaria, crassa, præter costam avenia v. obscure reticulata. Calyx corolla dimidio brevior v. brevissimus. Semina longitudinalia.*

133. A. GLADIIFORMIS, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 354. Glabra. Phyllodia lineari-lanceolata, curva, obtusissima, basi longe contracta, crasso-coriacea, nitida, marginibus incrassatis. Capitula densiflora. Sepala distincta, angusta. Legumen elongatum, planum, flexuosum, ad 3 lin. latum.—*Fl. Austral.* ii. 365.

Hab. Extratropical East Australia.

134. A. OBTUSATA, *Sieb.! in DC. Prod.* ii. 453. Glabra. Phyllodia oblongo-linearia, obtusissima, basi contracta, 1½–3-pollicaria, crasse coriacea. Capitula densiflora. Sepala distincta, spathulata. Legumen ignotum.—*Benth. Fl. Austral.* ii. 366.

Hab. Extratropical East Australia.

135. A. RUBIDA, *A. Cunn.! in Field, New S. Wales*, 344. Glabra. Phyllodia lanceolata, subfalcata, acuminata, basi contracta, ad 3 poll. longa, costa marginibusque nerviformibus prominentibus. Capitula parvula, 10–12-flora. Sepala sæpius cohærentia. Legumen ignotum.—*Benth. Fl. Austral.* ii. 366.

A. amœna, Sieb.! Pl. Exs., non Wendl.

Hab. Extratropical East Australia. Perhaps a variety of *A. amœna*.

136. A. AMŒNA, *Wendl. Comm. Acac.* 16, t. 4. Glabra v. rami novelli pubescentes. Phyllodia lanceolata, recta v. falcata, obtusa, basi contracta, 1½–2½-pollicaria v. ramorum sterilium longiora, costa marginibusque nerviformibus prominulis, margine 1–3-glanduloso. Capitula 8–12-flora. Sepala demum soluta. Legumen planum, pluripollicare, 3–4 lin. latum, marginibus nerviformibus incrassatis.—*Benth. Fl. Austral.* ii. 366.

Hab. Extratropical East Australia.

This is the only species in which I have observed the funicle enveloping the seed in a triple fold, although in many others it extends twice round. The constancy of the character requires, however, further proof.

137. A. HAKEOIDES, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 354. Glabra v. vix pubescens. Phyllodia lineari-spathulata v. anguste oblongo-lanceolata, obtusa, basi longe contracta, 2–5-pollicaria, crassiuscula, 1-nervia, marginibus vix prominulis, medio 1-glandulosa. Capitula ad 20-flora. Sepala facile solvenda. Legumen planum, curvulum, 2–3 lin. latum, inter semina valde contractum.—*Benth. Fl. Austral.* ii. 367.

Hab. Extratropical East Australia : desert interior.

138. A. SALICINA, *Lindl.! in Mitch. Three Exped.* ii. 20. Glabra, pallens v. glauca. Phyllodia oblongo-linearia v. lanceolata, sæpius obtusa, basi longe contracta, 2–5 poll. longa, vix semipollicem lata, crassiuscula, costa parum prominula, venis obscuris. Capitula multiflora. Calyx parvus, truncatus. Legumen rectum, 1–3-pollicare, ad 3 lin. latum, valvis duris convexiusculis.—*Dietr. Fl. Univ.* t. 83; *Benth. Fl. Austral.* ii. 367.

A. ligulata, A. Cunn.! Benth. in Hook. Lond. Journ. i. 362.

Hab. Extratropical Australia, East and West : desert interior.

Var.? VARIANS. Phyllodia sæpius majora, latiora, fere ut in *A. penninervi*, pennivenia, glandula tamen marginali carentia. An species propria?

A. varians, Benth. in Mitch. Trop. Austr. 132.

Hab. Tropical and subtropical East Australia.

139. A. ROSTELLIFERA, *Benth.! in Hook. Lond. Journ.* i. 356. Glabra, *A. salicinæ* valde affinis. Phyllodia lineari-lanceolata, 2–5-pollicaria, costa prominula, venis obscuris. Capitula multiflora et calyx brevis *A. salicinæ*. Petala lævia nec costata ut in affini *A. cyanophylla*. Legumen ignotum.—*Benth. Fl. Austral.* ii. 368.

A. subbinervia, Meissn. in Pl. Preiss. i. 16.

Hab. South-west Australia.

140. A. PYCNOPHYLLA, *Benth.! Fl. Austral.* ii. 368. Glabra. Phyllodia conferta, erecta, linearia, obtusa, $1\frac{1}{2}$–3-pollicaria, crassiuscula, præter costam enervia, eglandulosa. Capitula 10–15-flora. Calyx breviter lobatus. Legumen lineare, planum, $1\frac{1}{2}$–2 lin. latum, inter semina continuum, marginibus incrassatis.

A. crassiuscula, Meissn.! in Pl. Preiss. i. 16, non Sieb.

Hab. South-west Australia.

141. A. HARVEYI, *Benth.! Fl. Austral.* ii. 368. Glabra. Phyllodia anguste linearia, obtusa, 2–3-pollicaria, basi contracta, crassiuscula, costa vix prominula, avenia. Capitula parva, multiflora. Calyx breviter lobatus. Legumen planum, 3-pollicare v. longius, ultra $\frac{1}{2}$ poll. latum, coriaceum, transverse reticulatum, marginibus vix incrassatis.

A. ramosissima, Benth. olim ex parte; Meissn.! in Pl. Preiss. i. 16.

Hab. South-west Australia.

The phyllodia closely resemble those of *A. ramosissima* and *A. pycnophylla*; but the pod is very different.

(See also the longest-leaved forms of 151. *A. crassiuscula* and 152. *A. decora*.)

**** *Phyllodia linearia v. lanceolata. Legumen planum, obtusissimum, seminibus transversis. Racemi juniores sæpius bracteis imbricatis obtecti. Sepala distincta.*

† *Ramuli acutanguli. Sepala tenuissima. Legumen coriaceum.*

142. A. SUAVEOLENS, *Willd. Spec.* iv. 1050. Glabra, sæpe glauca. Phyllodia linearia v. sublanceolata, pleraque 3–4-pollicaria v. interdum longiora, costa marginibusque nerviformibus prominentibus. Capitula 6–10-flora. Legumen 1–$1\frac{1}{2}$-pollicare, 6–8 lin. latum.—*Lodd. Bot. Cab.* t. 730; *Reichb. Ic. et Descr. Pl.* t. 46; *Benth. Fl. Austral.* ii. 369.

Mimosa suaveolens, Sm.! in Trans. Linn. Soc. i. 253; Labill.! Pl. Nov. Holl. ii. 87, t. 236.

M. obliqua, Lam. in Journ. Hist. Nat. i. 89, t. 5, non Pers.

Acacia obliqua, Desv. Journ. Bot. 1814, i. 67.

M. angustifolia, Jacq. Hort. Schoenbr. iii. 74, t. 391.

Acacia angustifolia, Wendl. Comm. Acac. 34.

A. odorata, Desv. Journ. Bot. 1814, i. 67.

Mimosa ambigua, Salisb. Prod. 325.

Hab. Extratropical South-east Australia and Tasmania.

143. A. SUBCÆRULEA, *Lindl.! Bot. Reg.* t. 1075. Glabra, glauca. Phyllodia linearia v. lanceolata, $1\frac{1}{2}$–3-pollicaria, 2–4 lin. lata, costa prominula, marginibus tenuiter nervi-

formibus. Capitula multiflora. Legumen 1–1½- rarius 2-pollicare, 6–9 lin. latum.—*Benth. Fl. Austral.* ii. 369.

A. hemiteles, Benth.! in Linnæa, xxvi. 619.

A. apiculata, Meissn.! in Pl. Preiss. i. 17.

Hab. South-west Australia.

144.? A. LINDLEYI, *Meissn.! in Pl. Preiss.* i. 14. Glabra, glauca. Phyllodia lanceolata, basi contracta, inferiora 6–10-pollicaria, tenuiter pennivenia, superiora iis *A. subcæruleæ* similiora. Capitula multiflora. Legumen ignotum.—*Benth. Fl. Austral.* ii. 370.

Hab. South-west Australia.

The specimens seen are very unsatisfactory, but they appear to represent a species nearly allied to but distinct from *A. subcærulea*.

†† *Rami vix angulati. Sepala angustissima. Legumen membranaceum.*

145. A. LEPTOPETALA, *Benth.! in Linnæa,* xxvi. 619. Glabra, subglauca. Phyllodia oblongo-linearia v. lanceolata basi contracta, 1–2-pollicaria, costa vix prominula, venis obscuris. Capitula multiflora. Legumen 2–3-pollicare, ad 6 lin. latum.—*Fl. Austral.* ii. 370.

Hab. South-west Australia.

146. A. MURRAYANA, *F. Muell.! Benth. Fl. Austral.* ii. 370. Glabra. Phyllodia linearia, 5–6-pollicaria, 1–1½ lin. lata, crassa, costa vix prominula, venis obscuris. Capitula multiflora. Legumen 2–3-pollicare, ad 4 lin. latum.

Hab. Extratropical East Australia: desert interior.

***** *Phyllodia linearia lanceolata v. oblique oblonga, sesquipollicem non excedentia* (*excepta* A. subulata), *marginibus non incrassatis. Calyx brevis, breviter lobatus v. truncatus. Legumen lineare, seminibus longitudinalibus.*

147. A. SUBULATA, *Bonpl. Jard. Malm.* 110, t. 45. Glabra. Phyllodia anguste linearia, 3–6-pollicaria, vix lineam lata, haud crassa. Capitula parva, 12–20-flora. Calyx dentatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 370.

Hab. Extratropical East Australia.

Near *A. linifolia,* but readily known by the long narrow phyllodia.

148. A. LINIFOLIA, *Willd. Spec.* iv. 1051, Glabra v. minute puberula. Phyllodia linearia v. lineari-lanceolata, apice basique contracta, 1–1½-pollicaria, 1½–2 rarius 2½ lin. lata, haud crassa, costa prominula, marginibus tenuiter nerviformibus. Capitula parva, 8–12-flora. Legumen lineare, planum, 2–4-pollicare, 4–6 lin. latum, inter semina continuum.—*Bonpl. Jard. Malm.* t. 19; *Bot. Mag.* t. 2168; *Lodd. Bot. Cab.* t. 383?; *Benth. Fl. Austral.* ii. 371.

Mimosa linifolia, Vent. Jard. Cels. t. 2; Andr. Bot. Rep. t. 394.

M. linearis, Wendl. Bot. Beob. 56 et Hort. Herrenh. t. 18, non Sims.

Acacia abietina, Willd. Spec. iv. 1051.

Mimosa abietina, Poir. Dict. Suppl. i. 60.

Hab. Extratropical and subtropical East Australia.

149. A. PROMINENS, *A. Cunn.! in G. Don, Gen. Syst.* ii. 406. Glabra, sæpius glauca.

Phyllodia lineari-lanceolata v. oblongo-falcata, acutiora et sæpius latiora quam in *A. linifolia*, glandula marginali a basi remotiore, pleraque 1–1½-pollicaria, 2–4 v. rarius 5 lin. lata. Capitula parva, 8–12-flora. Legumen lineare, planum, 2–3-pollicare, 3–4 rarius 5 lin. latum, inter semina continuum.—*Bot. Mag.* t. 3502; *Dietr. Fl. Univ.* t. 83? *Benth. Fl. Austral.* ii. 371.

A. fimbriata, A. Cunn.! in G. Don, Gen. Syst. ii. 406.

Hab. Extratropical East Australia.

150. A. LEICHARDTII, *Benth.! Fl. Austral.* ii. 372. Hirsuta. Phyllodia lineari-lanceolata, falcata, pollicem rarius excedentia, costa marginibusque nerviformibus prominulis ciliatis. Capitula multiflora. Legumen planum, hispidum, 2–4-pollicare, ad 4 lin. latum.

Hab. Subtropical East Australia.

151. A. CRASSIUSCULA, *Wendl. Comm. Acac.* 31, t. 8. Glabra, subglauca. Phyllodia linearia, subfalcata, 1½–2-pollicaria v. rarius sub-3-pollicaria, 1½–3 lin. lata, crassiuscula, 1-nervia, avenia, marginibus nerviformibus. Capitula dense multiflora. Calyx demum in sepala solvendus. Legumen lineare, crassiusculum, ad 2½ lin. latum, inter semina contractum.—*Benth. Fl. Austral.* ii. 372.

A. adunca, A. Cunn.! in G. Don, Gen. Syst. ii. 406.

A. Sieberiana, Tausch, in Flora, 1836, 420, non DC.

Hab. Extratropical East Australia and Tasmania.

152. A. DECORA, *Reichb. Icon. Exot.* t. 199. Glabra v. glauco-tomentella. Phyllodia lanceolata v. linearia, basi contracta, 1–2-pollicaria, 1-nervia, marginibus nerviformibus. Capitula ad 20-flora. Legumen planum, rectum v. curvum, ad 3 lin. latum. Semina margini superiori approximata.—*Benth. Fl. Austral.* ii. 372.

Hab. Subtropical and extratropical East Australia.

153. A. BUXIFOLIA, *A. Cunn.! in Field, New S. Wales*, 344. Glabra. Phyllodia oblique oblongo-lanceolata, apice basique contracta, sæpius pollice breviora, costa vix prominula. Capitula 8–12-flora. Legumen planum, rectum v. curvum, ad 3 lin. latum. Semina margini inferiori approximata.—*Hook. Ic. Pl.* t. 164; *Benth. Fl. Austral.* ii. 372.

Hab. Subtropical and extratropical East Australia.

154. A. LUNATA, *Sieb.! in DC. Prod.* ii. 452. Glabra, sæpe glauca. Phyllodia oblongo-falcata v. subovata, valde obliqua, obtusa, sæpius pollice breviora, 3–6 lin. lata, 1-nervia, marginibus vix prominulis. Capitula 4–10-flora. Legumen planum, glaucum, rectum v. curvum, 3–4 lin. latum. Semina margini superiori approximata.—*Bot. Reg.* t. 1352; *Lodd. Bot. Cab.* t. 384; *Sweet, Fl. Austral.* t. 42; *Benth. Fl. Austral.* ii. 373.

A. falcinella, Tausch, in Flora, 1836, 419.

A. brevifolia, Lodd. Bot. Cab. t. 1235?

A. oleæfolia, A. Cunn.! in G. Don, Gen. Syst. ii. 405.

A. dealbata, A. Cunn.! in Field, New S. Wales, 345, non Lindl.

A. furfuracea, G. Don, Gen. Syst. ii. 405.

Hab. Extratropical East Australia.

****** *Phyllodia ovata obovata v. late oblonga, infrapollicaria v. vix* 1½ *poll. excedentia.*

† *Racemi breves, oligocephali.*

155. A. BRACHYBOTRYA, *Benth.! in Hook. Lond. Journ.* i. 347. Glabra v. apice argenteo-sericea. Phyllodia oblique obovata v. oblonga, ½–1-pollicaria, 1-nervia, pennivenia. Capitula multiflora. Sepala subdistincta. Legumen lineare, 3–5 lin. latum, planum v. valvis ad semina alternatim convexis concavisque.—*Benth. Fl. Austral.* ii. 373.

A. dictyocarpa, Benth.! in Linnæa, xxvi. 616.

Var. ARGYROPHYLLA, plus minus argenteo-sericea.

A. argyrophylla, Hook.! Bot. Mag. t. 4384.

A. bombycina, Benth.! in Lindl. and Paxt. Fl. Gard. ii. 101, f. 186.

Hab. Extratropical East Australia: desert interior.

156. A. WATTSIANA, *F. Muell.! Benth. Fl. Austral.* ii. 374. Glabra. Phyllodia obovato-oblonga, obtusissima, basi contracta, ½–1-pollicaria, 1-nervia, obscure venosa. Capitula 15–20-flora. Calyx brevis, dentatus. Legumen falcatum, coriaceum, 2–4-pollicare, 3–4 lin. latum, inter semina contractum.

Hab. South Australia: a single specimen in Herb. F. Mueller.

†† *Racemi pleiocephali, phyllodio multo longiores.*

157. A. PODALYRIÆFOLIA, *A. Cunn.! in G. Don, Gen. Syst.* ii. 405. Glauca farinosa v. minute pubescens, rarius glabrata. Phyllodia obovata ovata v. oblonga, obliqua, pollicaria v. paullo longiora, 1-nervia. Capitula parva, multiflora. Calyx minute dentatus. Legumen planum, uni- v. pluripollicare, ¾ poll. latum, glabrum v. pubescens.—*Benth. Fl. Austral.* ii. 374.

A. Fraseri, Hook.! Ic. Pl. t. 171.

A. Caleyi, A. Cunn.! Benth. in Hook. Lond. Journ. i. 347. Specimina depauperata ineunte inflorescentia.

Hab. Subtropical East Australia.

158. A. UNCIFERA, *Benth.! in Mitch. Trop. Austr.* 341. Velutino-pubescens. Phyllodia oblique oblonga v. elliptica, falcata, apice basique contracta, uncinato-acuta, 1½-pollicaria v. paullo longiora, 1½–1¾ poll. lata, 1-nervia. Capitula parva, multiflora. Legumen ignotum.—*Benth. Fl. Austral.* ii. 374.

Hab. Subtropical East Australia.

159. A. VESTITA, *Ker! in Bot. Reg.* t. 698. Molliter pubescens v. villosa. Phyllodia oblique ovali-elliptica, recurvo-falcata, undulata, pleraque semipollicaria, 1-nervia. Capitula parva, 10–20-flora. Calyx breviter lobatus. Legumen planum, rectum, 1½–3-pollicare, 4–5 lin. latum.—*Benth. Fl. Austral.* ii. 375.

Hab. Extratropical East Australia.

160. A. CULTRIFORMIS, *A. Cunn.! in G. Don, Gen. Syst.* ii. 406. Glabra v. glauco-subfarinosa. Phyllodia oblique oblongo-lanceolata, recurvo-falcata v. subtriangularia, ½–¾-pollicaria, 1-nervia, marginibus incrassato-nerviformibus. Capitula 10–20-flora. Calyx breviter lobatus. Legumen planum, glaucum, 2–3-pollicare, 3 rarius 4 lin. latum. —*Hook. Ic. Pl.* t. 170; *Paxt. Mag.* xi. 123 *cum ic.*; *Benth. Fl. Austral.* ii. 375.

A. scapuliformis, A. Cunn.! in G. Don, Gen. Syst. ii. 405.
A. glaucifolia, Baum. Cat. Hort. Bollw. ex descr. Meissn. in Pl. Preiss. i. 14.
Hab. Extratropical East Australia.

161. A. PRAVISSIMA, *F. Muell.! Fragm. Phytogr. Austral.* i. 5; *Pl. Vict.* t. 24. Glabra. Phyllodia late et oblique falcato-obovata v. subtrapezoidea v. triangularia, 3–5 lin. v. rarius semipollicem longa, 1–2-nervia. Capitula parva, 8–12-flora. Calyx brevis, obtuse lobatus. Legumen planum, glabrum.—*Benth. Fl. Austral.* ii. 375.
Hab. South-east Australia.

162. A. PYRIFOLIA, *DC.! Mém. Lég.* 447. Glabra, subglauca. Ramuli compressiusculi. Stipulæ breves, spinescentes. Phyllodia late ovata, pungenti-mucronata, 1–3-pollicaria, 1-nervia, pennivenia. Capitula densissime multiflora. Sepala distincta, linearia-clavata. Legumen planum, curvum v. circinatum, 2–3-pollicare, 4–6 lin. latum, valvis demum ad semina convexis.—*Benth. Fl. Austral.* ii. 376.
Hab. Tropical and extratropical West Australia.

******* *Capitula dense racemosa, floribus 4-meris in capitulo 2–3nis.*

163. A. MYRTIFOLIA, *Willd. Spec.* iv. 1054. Glabra, interdum glauca. Phyllodia obliqua v. falcata, obovata lanceolata v. linearia, sæpius 1–2-pollicaria, costa marginibusque nerviformibus prominentibus. Flores majusculi. Legumen lineare, curvum, marginibus crassis, 1–2 poll. longum, ad 2 lin. latum, valvis duris sublignosis.—*Sweet, Fl. Austral.* t. 49; *Lodd. Bot. Cab.* t. 772; *Benth. Fl. Austral.* ii. 376.
Mimosa myrtifolia, Sm.! in Trans. Linn. Soc. i. 252; Bot. Nov. Holl. t. 15.
Var. CELASTRIFOLIA, Phyllodia sæpe pollicem lata.
A. celastrifolia, Benth. in Hook. Lond. Journ. i. 349; Bot. Mag. t. 4306.
A. Pawlikowskyana et *A. Ludwigii*, Ohlend. ex Seem. Eingef. Acac. 28.
Var. ANGUSTIFOLIA, Phyllodia 2–4 lin. lata, sæpius ultra 2 poll. longa.
A. marginata, R. Br.! in Ait. Hort. Kew. ed. 3, v. 462; Wendl. Comm. Acac. t. 5 A.
A. trigona, A. DC.! Not. 8 Pl. Rar. Jard. Gen. 20.
Hab. Extratropical Australia and Tasmania, the typical forms chiefly in the eastern colonies, the broad and the narrow-leaved varieties chiefly in South-west Australia, but all the forms passing into each other.

Subseries 7. Plurinerves. *Phyllodia complanata, obtusa v. rarius in speciebus latifoliis pungentia, 2- v. plurinervia. Capitula globosa, ad axillas solitaria fasciculata v. rarius breviter racemosa.*

A. Armatæ. *Stipulæ spinescentes. Phyllodia falcata, angusta v. lata, subulato-acuminata v. subpungentia.*

164. A. SCALPELLIFORMIS, *Meissn.! in Pl. Preiss.* ii. 200. Glabra v. puberula. Phyllodia oblique triangulari-lanceolata, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria, 3–5 lin. lata, 2-nervia, pennivenia. margine superiore nerviformi ad angulum glandulifero. Pedunculi 1-cephali. Legumen elongatum, sæpe tortum, vix $1\frac{1}{2}$ lin. latum, marginibus crassis.—*Benth. Fl. Austral.* ii. 377.
Hab. South-west Australia.

165. A. UROPHYLLA, *Benth.! in Bot. Reg.* 1841, *Misc.* 24. Glabra v. leviter hirsuta. Phyllodia semiovata v. late ovato-lanceolata, subulato-acuminata, valde obliqua, 1½–3-pollicaria, ¾–1 poll. lata v. in cultis majora, 2–4-nervia, margine superiore curvo crenulato-sinuato, prope basin glandulifero. Legumen 5–6-pollicare, sæpe tortum, vix 1½ lin. latum, marginibus crassis.—*Bot. Mag.* t. 4573; *Benth. Fl. Austral.* ii. 377.

A. smilacifolia, Field. et Gardn.! Sert. Pl. t. 3.

Hab. South-west Australia.

B. Triangulares. *Stipulæ setaceæ v. minutæ. Phyllodia parva, semipollicem non excedentia, late falcato-ovata v. triangularia, breviter mucronato-subpungentia.*

166. A. SUBLANATA, *Benth.! in Hueg. Enum.* 42. Junior lanato-pubescens, demum glabrata. Phyllodia falcata, late triangularia v. lanceolata, semipollice breviora, 3- v. plurinervia. Capitula 20–30-flora, longiuscule pedunculata. Legumen lineare, tortum, glabrum, ad 2 lin. latum.—*Fl. Austral.* ii. 378.

A. pravifolia. F. Muell.! Fragm. Phytogr. Austral. i. 4.

Hab. South Australia.

167. A. AMBLYGONA, *A. Cunn.! Benth. in Hook. Lond. Journ.* ii. 332. Pubescens. Phyllodia falcato-lanceolata v. triangularia, 3–4 lin. longa, plurinervia. Capitula 10–15-flora, breviter pedunculata. Legumen curvum, glabrum, 1½–2 lin. latum, inter semina contractum.—*Fl. Austral.* ii. 378.

A. Nernstii, F. Muell.! Fragm. Phytogr. Austral. iv. 3.

Hab. Subtropical and extratropical East Australia.

168. A. DELTOIDEA, *A. Cunn.! in G. Don, Gen. Syst.* ii. 401. Glabra v. junior pubescens. Phyllodia oblique triangulari-ovata, acuta, 2–3 lin. longa, plurinervia. Flores in capitulo numerosi, minimi. Calyx corolla multo brevior. Legumen elongatum, planum, 4 lin. latum, glanduloso-hispidum.—*Benth. Fl. Austral.* ii. 378.

Hab. Tropical Australia: north-west coast.

169. A. STIPULOSA, *F. Muell.! in Journ. Linn. Soc.* iii. 119. Glanduloso-pubescens v. hirsuta. Phyllodia oblique ovato-falcata v. subtriangularia, pungenti-acuta, 2–3 rarius 4 lin. longa, crassa, obscure plurinervia. Flores in capitulo numerosi, lineam longi. Calyx corollam subæquans. Legumen lineare, curvum, planum, 2–3 lin. latum, glanduloso-hispidum.—*Benth. Fl. Austral.* ii. 379.

Hab. Tropical Australia: north-west coast.

(See also 95. *A. decipiens,* and a few other *Uninerves Triangulares,* in which, besides the main nerve, there is sometimes a much fainter second one.)

C. Brevifoliæ. *Phyllodia pollice breviora, obovata ovata v. late oblonga, obtusissima, sæpe undulata. Stipulæ inconspicuæ.*

170. A. LOXOPHYLLA, *Benth.! in Linnæa,* xxvi. 622. Resinosa, cæterum glabra. Phyllodia oblique obovata v. oblonga, incurva, obtusissima, 2–6 lin. longa, obscure 2-nervia, cæterum avenia. Calyx breviter lobatus. Petala lævia. Legumen curvum, lineare, ad 2 lin. latum, valvis ad semina convexis.—*Fl. Austral.* ii. 379.

Hab. South-west Australia.

171. A. SETULIFERA, *Benth. ! in Linnæa*, xxvi. 625. Glabra. Phyllodia oblique ovata, obtusa, mucrone setiformi valde obliqua, vix 2 lineas excedentia, tenuiter plurinervia. Calyx dentatus, sepalis facile solvendis. Petala lævia. Legumen ignotum.—*Fl. Austral.* ii. 379.

Hab. Tropical Australia : north-west coast.

172. A. TRANSLUCENS, *A. Cunn. ! in Hook. Ic. Pl.* t. 160. Glabra v. junior pubescens. Phyllodia obliqua, ex obovato anguste oblonga, obtusa, ½–1-pollicaria, 2–4-nervia, glandula obliqua terminata. Calyx breviter dentatus. Petala striata. Legumen 1–1½-pollicare, planum at crassum, sublignosum, supra medium 2 lin. latum, basi longe contractum, intus inter semina septatum.—*Benth. Fl. Austral.* ii. 379.

Hab. Tropical Australia : north and north-west coast.

173. A. IMPRESSA, *F. Muell. ! in Journ. Linn. Soc.* iii. 133. Pubescens. Phyllodia oblique obovata v. obovato-oblonga, obtusa v. glanduloso-mucronata, ½–1-pollicaria, 3–5-nervia. Sepala distincta. Petala rigidula, striata. Legumen rectum, tenuiter coriaceum, planum, marginibus incrassatis, ad 6 lin. latum, glutinoso-villosum.—*Benth. Fl. Austral.* ii. 380.

Hab. Tropical Australia : north and north-west coast.

D. Oligoneuræ. *Phyllodia semipollice et sæpius pollice longiora, oblongo-lanceolata v. linearia, recta v. leviter falcata, 2–3-nervia, vix venulosa nec glutinosa* (*excepta* A. subporosa).

* *Capitula ad axillas breviter racemosa.*

174. A. BIVENOSA, *DC. Prod.* ii. 452. Glabra, subglauca v. aureo-flavescens. Phyllodia ex obovato oblongo-lanceolata, obtusa, 1½-3-pollicaria v. rarius breviora, basi contracta, 2-nervia, marginibus nerviformibus. Capitula irregulariter racemosa. Calyx sinuato-dentatus. Legumen elongatum, planum, coriaceum, ad 3 lin. latum.—*Benth. Fl. Austral.* ii. 380.

A. binervosa, DC. Mém. Lég. 448.

A. xanthina, Benth. ! in Hook. Lond. Journ. i. 355.

A. elliptica, A. Cunn. ! Benth. in Hook. Lond. Journ. i. 347.

Hab. North-west tropical and West extratropical Australia.

175. A. TRINEURA, *F. Muell. ! Pl. Vict.* ii. 25. Glabra, glauca. Phyllodia anguste cuneato-oblonga, obtusissima, 1½–2-pollicaria, basi contracta, 3-nervia. Capitula brevissime racemosa. Sepala distincta. Legumen ignotum.—*Benth. Fl. Austral.* ii. 381.

Hab. South-east Australia : desert interior.

** *Capitula ad axillas solitaria v. fasciculata.*

176. A. NITIDULA, *Benth. ! Fl. Austral.* ii. 381. Glabra. Phyllodia lineari-cuneata, ½–1½-pollicaria, crassiuscula, rigida, præter margines nerviformes 2- rarius 3-nervia. Sepala distincta. Legumen ignotum.

Hab. South-west Australia.

177. A. HETEROCLITA, *Meissn ! in Pl. Preiss.* i. 18. Glabra v. juniora minute sericeo-

puberula. Phyllodia lineari-lanceolata v. linearia, 1½–3-pollicaria, rigidula, tenuiter 3-nervia. Sepala distincta. Legumen anguste lineare, planum, 2–3-pollicare, 1½ lin. latum, marginibus nerviformi-incrassatis.—*Benth. Fl. Austral.* ii. 381.

A. trissoneura, F. Muell.! Fragm. Phytogr. Austr. iv. 6.

Hab. South-west Australia.

178. A. ELONGATA, *Sieb.! in DC. Prod.* ii. 451. Glabra v. junior sericeo-pubescens. Phyllodia anguste linearia, 2–3- rarius 4-pollicaria, 1–1½ rarius 2 lin. lata, 3-nervia et interdum oblique venulosa. Calyx obtuse lobatus. Legumen lineare, rectum, planum, 1½–2 lin. latum.—*Bot. Mag.* t. 3337; *Benth. Fl. Austral.* ii. 381.

A. hebecephala, A. Cunn.! in Loud. Hort. Brit. 406.

Hab. Extratropical East Australia.

179. A. SUBPOROSA, *F. Muell.! Pl. Vict.* ii. 24. Glabra, junior glutinosa. Phyllodia lineari-lanceolata v. linearia, acuta, subfalcata, 1½–3- rarius 4-pollicaria, 2–4 lin. lata, tenuiter 2–3-nervia et inter nervos interdum longitudinaliter venulosa, subpellucido-punctata. Calyx lobatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 382.

Hab. South-west Australia.

180. A. SIMSII, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 368. Glabra. Phyllodia linearia v. lanceolata, sæpius falcata, 2–5-pollicaria, 1½–3 lin. lata, haud crassa, vulgo prominule 2–3-nervia et inter nervos longitudinaliter venulosa, interdum minus inæqualiter multinervia. Calyx lobatus, sepalis facile solvendis. Legumen rectum, planum v. undulatum, 2–3 lin. latum.—*Fl. Austral.* ii. 382.

Hab. Tropical North and North-east Australia.

The venation of the phyllodia and the general habit pass into those of the *Venosæ*,; but in the typical form the prominence of 2 or 3 nerves is characteristic of the *Oligoneuræ*.

(Amongst species of other groups which have narrow, occasionally 2-nerved phyllodia, see 13. *A. cochlearis*; 113. *A. montana*; 114. *A. verniciflua*; 191. *A. Whanii*, and 194. *A. ixiophylla*.)

E. Microneuræ. *Glabræ v. glaucæ nec glutinosæ. Phyllodia angusta v. rarius obovata, crassa, avenia v. venis parallelis crebris tenuissimis vix conspicuis.*

181. A. LEPTOSPERMOIDES, *Benth.! in Linnæa*, xxvi. 626. Glabra. Phyllodia cuneato-oblonga, obtusa, 1½-pollicaria v. paullo longiora, crassiuscula, avenia v. tenuissime et vix conspicue plurinervia. Capitula solitaria breviter pedunculata. Sepala distincta. Legumen ignotum.—*Fl. Austral.* ii. 383.

Hab. South-west Australia.

182. A. HOMALOPHYLLA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 365 (errore *omalophylla*). Glabra v. minute canescens. Phyllodia lanceolato-falcata, anguste oblonga v. linearia, 1–3-pollicaria, 1–4 lin. lata, crassa, sub lente tenuissime multinervia. Capitula pedunculata, ad axillas fasciculata. Sepala distincta v. leviter connata. Legumen lineare, coriaceum, 2–3 lin. latum, longitudinaliter venosum, valvis ad semina convexis, inter semina contractis.—*Fl. Austral.* ii. 383.

Hab. Extratropical East Australia: desert interior.

183. A. PENDULA, *A. Cunn.! in G. Don, Gen. Syst.* ii. 404. Minute cinereo-puberula, ramis sæpius pendulis. Phyllodia lineari-lanceolata, falcata, acuminata, 2–3-pollicaria, rigidule coriacea, sub lente multinervia. Pedunculi breves, ad axillas fasciculati. Calyx lobatus, sepalis facile solvendis. Legumen planum, tenue, 5–6 lin. latum, transverse venosum, marginibus angustissime carinato-alatis.—*Benth. Fl. Austral.* ii. 383.

A. leucophylla, Lindl.! in Mitch. Three Exped. ii. 13.

Hab. Extratropical and subtropical East Australia, in the interior.

184. A. OSWALDI, *F. Muell.! Pl. Vict.* ii. 27. Glabra v. junior canescenti- v. sericeo-pubescens. Phyllodia falcato-lanceolata, nunc lineari- v. oblongo-lanceolata, 1½–2-pollicaria, rigida, tenuissime multinervia. Capitula subsessilia, fasciculata. Sepala distincta. Legumen elongatum, curvum v. tortum, durum, sublignosum, 3–4 lin. latum.—*Benth. Fl. Austral.* ii. 384.

Hab. Extratropical East Australia: desert interior.

185. A. LINEOLATA, *Benth.! in Linnæa,* xxvi. 626. Sericeo-pubescens, mox glabrata. Phyllodia anguste linearia, erecta, 1½–2-pollicaria, 1–2 lin. lata, rigida, sub lente tenuissime multinervia, nervis 3 rarius prominulis. Capitula brevissime pedunculata. Sepala subdistincta. Legumen ignotum.—*Fl. Austral.* ii. 384.

Hab. South-west Australia.

186. A. CORIACEA, *DC. Mém. Lég.* 446. Cinerascens v. junior sericeo-canescens v. flavescens. Phyllodia recta v. curva, semipedalia v. longiora, 1–2½ lin. lata, crasse coriacea, sub lente tenuissime multinervia. Capitula pedunculata, cano-pubescentia. Calyx breviter lobatus. Legumen ½–¾-pedale, 4–5 lin. latum, anguste moniliforme, valvis ad semina turgidis striatis inter semina contractis.—*Benth. Fl. Austral.* ii. 385.

Hab. Tropical and extratropical West Australia.

187. A. STENOPHYLLA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 366. Glabra. Phyllodia linearia, acuminata v. falcata, ½–1-pedalia, 2–2½ lin. lata, tenuiter striato-multinervia. Capitula breviter racemosa. Calyx breviter lobatus, dense ciliatus. Petala pubescentia. Legumen elongato-moniliforme, ad semina turgidum, 4–5 lin. latum, inter semina contractum.—*Benth. Fl. Austral.* ii. 385.

A. sericophylla, F. Muell.! in Journ. Linn. Soc. iii. 122 (var.? phyllodiis angustioribus).

Hab. Tropical and extratropical East and Central Australia: desert interior.

F. Nervosæ. *Glabræ v. viscidulæ, rarius pubescentes. Phyllodia recta v. interdum falcata, multi- rarius sub-3-nervia.*

* *Australianæ.*

188. A. HEMIGNOSTA, *F. Muell.! in Journ. Linn. Soc.* iii. 134. Glauca. Phyllodia falcato-lanceolata v. oblonga, obtusa, 2–4-pollicaria, supra medium ½–¾ poll. lata, tenuiter 3–5-nervia, inter nervos reticulata. Capitula pedunculata. Sepala distincta. Legumen planum, 2–4-pollicare, ad 6 lin. latum, marginibus acutis.—*Benth. Fl. Austral.* ii. 385.

Hab. Tropical Australia: north and north-west coast.

189. A. SCLEROPHYLLA, *Lindl.! in Mitch. Three Exped.* ii. 139. Glabra (resinosa ?). Phyllodia oblongo-linearia, subcuneata, crassa, rigidula, ¾–1½ poll. longa, striato-pluri-

nervia. Pedunculi brevissimi. Sepala distincta, angusta. Legumen sub-2-pollicare, vix $1\frac{1}{2}$ lin. latum, valvis convexis, longitudinaliter striatis.—*Dietr. Fl. Univ.* t. 85 (quoad venationem falsa); *Benth. Fl. Austral.* ii. 386.

Hab. South-east Australia: desert interior.

190. A. FARINOSA, *Lindl.! in Mitch. Three Exped.* ii. 146. Glabra v. junior glauco-farinosa. Phyllodia lineari-cuneata, obtusa, crassa, rigidula, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria, nervis quam in *A. sclerophylla* tenuioribus. Pedunculi brevissimi, uti capitula farinoso-tomentosi. Sepala distincta, lineari-spathulata. Legumen lineare, curvum, 2–$2\frac{1}{2}$ lin. latum, valvis coriaceis duris non striatis, marginibus incrassatis.—*Benth. Fl. Austral.* ii. 386.

Hab. South-east Australia: desert interior.

191. A. WHANII, *F. Muell.! Benth. Fl. Austral.* ii. 386. Ramuli puberuli. Phyllodia oblongo-linearia, sæpe curva, obtusa, $1\frac{1}{2}$–2-pollicaria, rigide coriacea, striato-plurinervia, margine superiore infra medium glandulifero. Pedunculi brevissimi. Calyx lobatus, sepalis facile solvendis. Legumen ignotum.

Hab. South-east Australia.

192. A. HETERONEURA, *Benth.! in Linnæa*, xxvi. 624. Glabra. Phyllodia linearia, $1\frac{1}{2}$–3-pollicaria, 1–2 lin. lata, rigidula, costa valida nervisque utrinque tenuibus pluribus parallelis. Pedunculi tenues. Calyx late lobatus. Legumen ignotum.—*Fl. Austral.* ii. 387.

Hab. South-west Australia.

193. A. VISCIDULA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 363. Pubescens et resinoso-viscidula. Phyllodia linearia, obtusa, subincurva, 2–$2\frac{1}{2}$-pollicaria, 1–$1\frac{1}{2}$ lin. lata, coriacea, plurinervia. Pedunculi brevissimi. Sepala distincta, anguste spathulata. Petala pubescentia. Legumen lineare, rectum, pubescens, ad 2 lin. latum, marginibus incrassatis.—*Fl. Austral.* ii. 387.

Hab. Extratropical East Australia.

194. A. IXIOPHYLLA, *Benth.! in Hook. Lond. Journ.* i. 364. Glabra v. pubescens, glutinosa. Phyllodia oblongo-lanceolata v. late linearia, obtusa, obliqua v. falcata, $\frac{3}{4}$–$1\frac{1}{2}$ rarius 2 poll. longa, 2–3 rarius 4 lin. lata, coriacea, tenuiter striato-multinervia. Pedunculi breviter subracemosi. Sepala distincta, anguste spathulata. Legumen flexuosum, hispidum v. glabrum, 2–3 lin. latum.—*Fl. Austral.* ii. 387.

A. glutinosa, F. Muell.! Fragm. Phytogr. Austral. iv. 6.

Hab. Subtropical and extratropical East Australia, in the interior, and in extratropical West Australia.

I can find no difference between the western specimens published as *A. glutinosa* and the eastern ones gathered by Cunningham, Mitchell, and others. The pod, however, is only known in the former.

195. A. DICTYOPHLEBA, *F. Muell.! Fragm. Phytogr. Austral.* iii. 128. Glabra, resinosa. Phyllodia cuneato-oblonga v. lanceolato-falcata, obtusa, 2–3-pollicaria, 2–5 lin. lata, rigide coriacea, nervis pluribus retique venularum prominulis resinoso-scabris. Pedunculi longiusculi. Calyx breviter dentatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 388.

Hab. Tropical Australia: northern interior.

196. A. VENULOSA, *Benth.! in Hook. Lond. Journ.* i. 366. Molliter pubescens v. glabra, vix glutinosa. Phyllodia falcato-oblonga v. lanceolata, 2–3-pollicaria, 3–6 lin. lata, rigide plurinervia et venulosa, nervis 3 sæpius magis prominulis. Pedunculi crassiusculi, tomentosi. Sepala basi connata. Legumen lineare, junius pubescens, 1–2-pollicare, ad 3 lin. latum, valvis ad semina convexis.—*Fl. Austral.* ii. 388.

Hab. Extratropical East Australia.

197. A. CYCLOPS, *A. Cunn.! in G. Don, Gen. Syst.* ii. 404. Glabra. Phyllodia anguste oblonga, sæpius recta, obtusa, $1\frac{1}{2}$–3- rarius 4-pollicaria, rigide coriacea, 3–5-nervia et venulosa. Pedunculi glabri. Calyx breviter lobatus. Legumen planum, pluripollicare, 4–6 lin. latum, sæpius curvum v. tortum.—*Benth. Fl. Austral.* ii. 388.

Hab. South-west Australia.

198. A. MELANOXYLON, *R. Br.! in Ait. Hort. Kew.* ed. 3, v. 462. Glabra v. junior minute puberula. Phyllodia falcato-oblonga v. sublanceolata, obtusa v. rarius acutiuscula, 3–4-pollicaria, $\frac{1}{2}$–1 poll. lata, coriacea, plurinervia et crebre venulosa. Capitula pedunculata, densissime multiflora. Calyx breviter lobatus. Legumen elongatum, sæpe valde curvatum, 3–4 lin. latum, marginibus nerviformibus incrassatis.—*Wendl. Comm. Acac.* t. 6; *Bot. Mag.* t. 1659; *Lodd. Bot. Cab.* t. 630; *Benth. Fl. Austral.* ii. 388.

A. latifolia, Desf. Cat. Hort. Par. ed. 2, 207.

A. arcuata, Sieb.! (nec Labill.) in Spreng. Syst. iii. 135.

A. brevipes, A. Cunn.! in Bot. Mag. t. 3358 (phyllodiis longioribus).

Hab. Extratropical and subtropical East Australia.

199. A. IMPLEXA, *Benth.! in Hook. Lond. Journ.* i. 368. Glabra, subglauca. Phyllodia lanceolato-falcata, acuminata, 5–6-pollicaria, plurinervia et tenuiter venulosa. Pedunculi tenues. Capitula parvula, densiflora. Calyx breviter lobatus. Legumen elongatum, curvum v. tortum, 2–3 lin. latum, inter semina contractum.—*Benth. Fl. Austral.* ii. 389.

Hab. Extratropical and subtropical East Australia.

200. A. HARPOPHYLLA, *F. Muell.! Benth. Fl. Austral.* ii. 389. Glabra v. junior minute canescens. Phyllodia falcato-lanceolata, apice angustata et obtusa, 6–8-pollicaria, tenuiter plurinervia et vix venulosa. Pedunculi tenues. Capitula 12–15-flora. Sepala distincta. Legumen ignotum.

Hab. Subtropical East Australia.

201. A. EXCELSA, *Benth.! in Mitch. Trop. Austr.* 225. Glabra v. junior minute pubescens. Phyllodia oblongo-falcata, obtusiuscula, 2–3-pollicaria, $\frac{1}{2}$–$\frac{3}{4}$ poll. lata, tenuiter coriacea, 5–7-nervia, vix venulosa. Pedunculi breves, rigiduli. Sepala distincta. Legumen rectum, planum, ad 3 lin. latum, vix dehiscens, marginibus tenuiter 2-sulcatis et inter sulcos angustissime carinato-subulatis.—*Fl. Austral.* ii. 390.

A. Daintreana, F. Muell.! Fragm. Phytogr. Austral. iv. 6.

Hab. Subtropical East Australia.

Very nearly allied to the New-Caledonian *A. laurifolia.*

202. A. COMPLANATA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 369. Glabra. Ramuli ancipites v. angustissime 2- rarius 3-alati. Phyllodia ovalia v. oblonga, obtusa,

2–3-pollicaria, ½–1 lin. lata, tenuiter coriacea, nervis 5–9 v. pluribus, paucivenulosa. Pedunculi tenues. Sepala distincta. Legumen planum, curvulum, 3–4 lin. latum, margine superiore nerviformi v. angustissime carinato.—*Fl. Austral.* ii. 390.

A. anceps, Hook.! Ic. Pl. t. 167, non DC.

Hab. Subtropical East Australia.

(See also 180. *A. Simsii*.)

** *Insulares, Australiæ exules.*

203. A. HETEROPHYLLA, *Willd. Spec.* iv. 1054. Glabra v. junior vix puberula. Phyllodia elongato-oblonga, rectiuscula, 3–5-pollicaria, 6–9 lin. lata, subcoriacea, hinc inde folio bipinnato terminata. Pedunculi crassiusculi. Calyx brevissime dentatus. Legumen planum, 3–4-pollicare, 3–6 lin. latum, marginibus nerviformibus, vix sulcatis.

Mimosa heterophylla, Lam.! Dict. i. 14, et Journ. Hist. Nat. i. t. 15.

Hab. Mauritius and Bourbon.

204. A. KOA, *A. Gray! Bot. Amer. Expl. Exped.* i. 480. Glabra v. junior flavescenti-pubescens. Phyllodia sæpius longiora et magis falcata quam in *A. heterophylla*, et legumen paullo latius. Cætera omnia conveniunt et phyllodia variant breviora et latiora.

A. heterophylla, Hook. et Arn.! Bot. Beech. 81; Benth. in Hook. Lond. Journ. i. 368, non Willd. ex A. Gray.

Hab. Sandwich Islands,

On comparing specimens, I have still strong doubts whether the Mauritius and Sandwich-Island plants can be distinguished by any constant characters.

205. A. RICHEI, *A. Gray! Bot. Amer. Expl. Exped.* i. 482, t. 53. Glabra. Phyllodia lanceolata, acuminata, subfalcata, 1½–3-pollicaria, 3–6 lin. lata, tenuiter coriacea, multinervia. Pedunculi filiformes. Capitula parva, glabra. Calyx breviter dentatus. Legumen 2–3-pollicare, planum, 6–8 lin. latum, valvis tenuibus reticulatis, marginibus tenuiter 2-sulcatis inter sulcos acute carinatis.

Hab. Islands of the South Pacific, and apparently the same species in Formosa, *Oldham.*

This species has nearly the foliage and aspect of *A. Simsii*, with the inflorescence and pods of *A. laurifolia*, from which it is readily distinguished by its narrow phyllodia, and especially by the calyx.

206. A. LAURIFOLIA, *Willd. Spec.* iv. 1053. Glabra. Phyllodia ovata oblonga v. late lanceolata, 2–4-pollicaria, 1½–3 poll. lata, tenuiter coriacea, multinervia. Pedunculi filiformes. Capitula parvula, glabra. Sepala distincta, anguste spathulata. Legumen 2–3-pollicare, planum, 6–9 lin. latum, valvis tenuibus reticulatis, marginibus tenuiter 2-sulcatis inter sulcos carinatis v. angustissime alatis.—*Labill. Sert. Austr.-Caled.* t. 68.

Mimosa simplicifolia, Linn. f. Suppl. 436.

M. Mangium, Forst. Prod. 75.

Hab. New Caledonia and islands of the South Pacific.

G. Dimidiatæ. *Phyllodia sæpius ampla, falcata v. valde obliqua, nervis 2–3 prominulis distantibus basi juxta marginem inferiorem sæpius approximatis v. cum eo confluentibus,*

venulis inter nervos reticulatis. Stipulæ minutæ v. 0 (*nec ut in* A. urophylla *spinescentes*).

207. A. BINERVATA, *DC. Prod.* ii. 452. Glabra. Phyllodia falcato-oblonga v. lanceolata, 3–4-pollicaria, inter nervos 2–3 pennivenia. Pedunculi tenues, ad axillas racemosi, racemo demum in ramum foliatum excrescente. Calyx sinuato-dentatus. Legumen elongatum, planum, tenue, 6–8 lin. latum, intus continuum.—*Benth. Fl. Austral.* ii. 390.

A. umbrosa, A. Cunn.! in G. Don, Gen. Syst. ii. 405; Bot. Mag. t. 3338.

A. dineura, F. Muell.! in Journ. Linn. Soc. iii. 130 (specimen fructiferum magis glaucescens).

Hab. Tropical North Australia and extratropical East Australia.

It is possible that I may have confounded two species; but Schultz's Port-Darwin specimens (in flower) closely resemble several of those from New South Wales. F. Mueller's fruiting specimens from the Upper Roper river have a rather different aspect; but I can find no distinctive character.

208. A. LATESCENS, *Benth.! in Hook. Lond. Journ.* i. 380. Glabra. Phyllodia falcato-lanceolata, obtusa, 6–9-pollicaria, venis inter nervos 2–3 paucis reticulatis v. subparallelis. Pedunculi tenues, ad axillas fasciculati. Calyx brevissime dentatus. Legumen subplanum, 4–5-pollicare, $\frac{1}{2}$ poll. latum, marginibus haud incrassatis, valvis reticulatis, intus inter semina subseptatum.—*Fl. Austral.* ii. 391.

Hab. Tropical Australia: north and north-west coast.

The foliage is sometimes nearly the same as in *A. binervata,* but the inflorescence and pod very different.

209. A. SERICATA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 380. Glabra glauca v. minute subfarinaceo-puberula. Phyllodia late falcata, obtusa, 3–4-pollicaria, medio 1–1$\frac{1}{2}$ poll. lata, apice basique contracta, in ramis sterilibus longiora, inter nervos 3–4 distantes basi cum margine confluentes reticulata. Legumen planum, glaucum, 3–5-pollicare, 1–1$\frac{1}{2}$ poll. latum, marginibus anguste carinato-subalatis, valvis tenuibus reticulatis inter semina (pulpa ?) subseptatum.—*Fl. Austral.* ii. 391.

A. platycarpa, F. Muell.! in Journ. Linn. Soc. iii. 145.

Hab. Tropical Australia: north and north-west coasts.

210. A. FLAVESCENS, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 381. Junior cano- v. flavescenti-tomentosa, glabrescens. Phyllodia late falcata, acuminata, 4–8-pollicaria, medio 1–3 poll. lata, inter nervos 2–3 apice ad marginem glanduliferos reticulata. Capitula breviter pedunculata (subpaniculata ?). Sepala anguste spathulata. Legumen planum, 3–5-pollicare, $\frac{3}{4}$ poll. latum, coriaceum, reticulatum, marginibus vix incrassatis.—*Fl. Austral.* ii. 391.

Hab. Tropical East Australia.

211. A. RETIVENIA, *F. Muell.! Fragm. Phytogr. Austral.* iii. 128. Tomento canescente sublanato undique vestita. Phyllodia oblique obovata v. suborbiculata, obtusissima, crassa, 1$\frac{1}{2}$–2-pollicaria, inter nervos 3–4 reticulata. Pedunculi ad axillas phyllodiorum superiorum multo minorum brevissimi. Calyx breviter lobatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 392.

Hab. Tropical Australia: northern interior.

Subseries 8. Julifloræ. *Phyllodia verticaliter compressa v. rarius teretia, in caulem articulata, plurinervia v. rarius* 1*-nervia, obtusa v. acuta rarius subpungentia. Spicæ cylindraceæ, densæ v. interruptæ, rarius dum sessiles breviter oblongæ.*

This includes all the spicate phyllodineous *Acaciæ* except *A. triptera*, which has decurrent phyllodia, and a few of the *Pungentes*, which have no immediate affinity with any of the following groups. Several of the species of this subseries are very difficult to identify without the fruit. This is especially the case with some of the tropical *Falcatæ*, which are absolutely undistinguishable as to foliage or flowers, but have different pods.

A. Rigidulæ. *Phyllodia plana, recta obliqua v. leviter falcata, sæpius obtusa v. mucrone calloso glanduloso v. curvo terminata, specierum priorum brevia, ultimarum* 3–4*-pollicaria. Spicæ densæ* (*excepta* A. megalantha). *Flores plerique* 5*-meri.*

212. A. AMENTIFERA, *F. Muell. ! in Journ. Linn. Soc.* iii. 141. Glabra. Phyllodia sæpe fasciculata, oblique oblonga, obtusa, 2–4 lin. longa, coriacea, enervia v. obscure 2-nervia. Spicæ sessiles, densæ. Sepala distincta, angusta. Legumen ignotum.—*Benth. Fl. Austral.* ii. 392.

Hab. Tropical North-west Australia.

213. A. WICKHAMI, *Benth. ! in Hook. Lond. Journ.* i. 377. Glabra, sæpe glauca v. resinosa. Phyllodia oblique ovata v. falcato-oblonga, obtusa, undulata, rarius semipollicem excedentia, nervis pluribus tenuibus v. 2–3 magis prominulis. Spicæ pedunculatæ, densæ. Calyx sinuato-dentatus. Legumen planum, crassum, lignosum, oblique venosum, sub-2-pollicare, supra medium 2 lin. latum.—*Fl. Austral.* ii. 392.

Hab. Tropical North and North-west Australia.

214. A. LYSIPHLŒA, *F. Muell. ! in Journ. Linn. Soc.* iii. 137. Glabra, sæpe resinosa. Phyllodia oblique lineari-oblonga linearia v. oblanceolata, sæpius obtusa, $\frac{1}{2}$–1-pollicaria, crassa, rigida, obscure v. prominule 3–5-nervia. Spicæ pedunculatæ, tenues, densifloræ. Sepala basi breviter connata. Legumen planum, durum, sublignosum, 1–2-pollicare, 3–6 lin. latum, valvis reticulatis.—*Benth. Fl. Austral.* ii. 393.

Hab. Tropical North and North-west Australia.

215. A. LINARIOIDES, *Benth. ! in Hook. Lond. Journ.* i. 371. Glabra v. leviter viscoso-pubescens. Phyllodia linearia, obtusa, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria, ad 1 lin. lata, obscure 1-nervia. Spicæ tenues, densiusculæ. Sepala distincta v. basi vix connata. Legumen lineare, curvulum, ad semina $1\frac{1}{2}$ lin. latum, inter semina contractum, valvis convexis obscure striatis, marginibus nerviformi-incrassatis.—*Fl. Austral.* ii. 393.

Hab. Tropical North Australia.

216. A. STIPULIGERA, *F. Muell. ! in Journ. Linn. Soc.* iii. 144. Tomentosa v. pubescens. Phyllodia oblique falcata, oblonga v. lanceolata, 1–2-pollicaria, 3–7 lin. lata, coriacea, nervis 2–4 marginibusque nerviformibus prominulis, venulis crebris anastomosantibus. Stipulæ parvæ, fuscæ. Spicæ subsessiles, densæ, tomentosæ. Calyx in sepala facile solvendus. Legumen lineare, subtortum, vix $1\frac{1}{2}$ lin. latum, marginibus nerviformibus.—*Benth. Fl. Austral.* ii. 393.

Hab. Tropical North-west Australia and northern interior.

217. A. PTYCHOPHYLLA, *F. Muell.! in Journ. Linn. Soc.* iii. 142. Resinosa, cæterum glabra. Phyllodia oblique oblonga, obtusissima, 1–1½-pollicaria, 2–3 lin. lata, rigide coriacea, prominenter 5–9-nervia, inter nervos avenia. Spicæ pedunculatæ, densæ. Calyx lobatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 394.

Hab. Tropical North-west Australia.

218. A. STIGMATOPHYLLA, *A. Cunn.! Benth.! in Hook. Lond. Journ.* i. 377. Glabra v. junior vix cano-pubescens. Phyllodia oblique anguste oblonga v. subfalcata, 1½–3-pollicaria, 3–4 lin. lata, undulata, tenuiter 3–5-nervia, inter nervos longitudinaliter denseque reticulato-venulosa. Spicæ tenues, subpaniculatæ. Calyx sinuato-dentatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 394.

Hab. Tropical North-west Australia.

219. A. UMBELLATA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 378. Junior cano-sericea, mox glabrata. Phyllodia oblonga v. late falcata, 2–4-pollicaria, ¾–1½ poll. lata, coriacea, tenuiter multinervia, nervis 5–9 validioribus, nonnullis interdum basi cum margine confluentibus. Spicæ subsessiles, densæ. Calyx sinuato-dentatus. Legumen falcatum v. rectum, subteres, angustum.—*Benth. Fl. Austral.* ii. 394.

Hab. Tropical North Australia.

220. A. LEPTOPHLEBA, *F. Muell.! in Journ. Linn. Soc.* iii. 143. Subglabra. Phyllodia oblique oblongo-falcata, obtusa, 2–2½-pollicaria, ad 6 lin. lata, coriacea, undulata, nervis 3 pluribusve, venis anastomosantibus crebris dense parallelis. Spicæ pedunculatæ, densæ. Calyx profunde lobatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 395.

Hab. Tropical North-west Australia.

221. A. LIMBATA, *F. Muell.! in Journ. Linn. Soc.* iii. 145. Glabra, glauca, ramis acutangulis. Phyllodia oblonga, falcata, 2–3-pollicaria, ½–¾ poll. lata, crasse coriacea, nervis pluribus, inferioribus basi cum margine nerviformi confluentibns. Flores ignoti. Legumen planum, durum, glabrum, 1½–2-pollicare, supra medium 4 lin. latum, basi contractum at sessile, oblique venosum, marginibus incrassatis.—*Benth. Fl. Austral.* ii. 395.

Hab. Tropical North Australia.

222. A. BREVIFOLIA, *Benth.! Fl. Austral.* ii. 395. Glabra, subglauca. Phyllodia oblique oblonga, subfalcata, obtusa, 1½–2-pollicaria, ½–¾ lin. lata, valde coriacea, pluri-nervia, reticulatim v. subparallele venosa. Spicæ pedunculatæ, breves. Calyx sinuato-dentatus. Legumen planum, crassum, sublignosum, 1½-pollicare, fere 4 lin. latum, stipitatum, oblique venosum, marginibus incrassatis.

A. leptophleba, var. *brevifolia,* F. Muell.! in Journ. Linn. Soc. iii. 143.

Hab. Tropical East Australia : desert Australia.

223. A. MEGALANTHA, *F. Muell.! in Journ. Linn. Soc.* iii. 143. Glabra. Phyllodia late semiovata v. lanceolato-falcata, 2–4-pollicaria, ¾–1 poll. lata, coriacea, 3–7-nervia et tenuiter parallele venosa. Spicæ pedunculatæ, longiusculæ. Flores subdissiti, alabastris oblongis 2 lin. longis. Calyx dentatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 395.

Hab. Tropical North-west Australia.

The individual flowers are larger than in any other true *Acacia* known to me.

224. A. GONOCLADA, *F. Muell.! in Journ.Linn. Soc.* iii. 140. Glabra, glauca, ramulis crassis acutangulis. Phyllodia lanceolato-oblonga, subfalcata, 3–4-pollicaria, 4–8 lin. lata, coriacea, nervis 2–3 prominulis basi cum margine subconfluentibus, venis crebris parallelis tenuibus. Spicæ breves, densæ, breviter pedunculatæ. Calyx breviter dentatus. Legumen lineare, 1–1½-pollicare, 1½ lin. latum, planum, tenue, marginibus nerviformibus.—*Benth. Fl. Austral.* ii. 396.

Hab. Tropical North-west Australia.

225. A. PYCNOSTACHYA, *F. Muell.! Pl. Vict.* ii. 33. Glabra, subglauca, ramulis acutangulis. Phyllodia oblongo-lanceolata, obliqua v. subfalcata, 3-, rarius 4-pollicaria, ½–¾ lin. lata, rigidula, tenuiter multinervia, nervis 3–4 subvalidioribus. Spicæ sessiles, longiusculæ, densifloræ. Calyx sinuato-dentatus. Legumen anguste lineare, planum, marginibus incrassatis, maturum ignotum.—*Benth. Fl. Austral.* ii. 396.

Hab. Extratropical East Australia.

Distinguished from the broad-leaved forms of *A. longifolia* by the inflorescence and the 5-merous flowers.

226. A. SUBTILINERVIS, *F. Muell.! Pl. Vict.* ii. 32. Glabra, ramulis teretiusculis. Phyllodia lanceolata, recta, 2–4-pollicaria, 3–6 lin. lata, coriacea, tenuiter multinervia, costa centrali magis prominula. Spicæ densiusculæ. Calyx sinuato-dentatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 396.

Hab. South-east Australia.

B. Tetrameræ. *Phyllodia plana, coriacea v. tenuia, recta v. falcata, plurinervia v. rarius angustissima et uninervia. Spicæ sæpe laxæ. Flores plerique v. omnes* 4*-meri. Semina longitudinalia.*

227. A. COCHLOCARPA, *Meissn.! in Bot. Zeit.* 1855, 10. Glabra, rigida. Phyllodia lineari-lanceolata, subfalcata, 2–4-pollicaria, 2–4 lin. lata, 5–7-nervia, costa centrali elevata. Spicæ sessiles, densæ. Sepala distincta, angusta. Legumen glabrum, lineare, in spiram cylindraceam densam 4 lin. diametro plurigyrosam contortum, valvis cæterum planis marginibus nerviformibus.—*Benth. Fl. Austral.* ii. 397.

Hab. South-west Australia.

228. A. DALLACHIANA, *F. Muell.! Fragm. Phytogr. Austral.* i. 7. Glabra, ramis angulatis subglaucis. Phyllodia lanceolato-falcata, 3–6-pollicaria, medio sæpe pollicem lata, 2–6-nervia et reticulato-venulosa. Spicæ sessiles, cylindraceæ, densæ. Calyx obtuse dentatus. Legumen lineare, rectiusculum, 2½ lin. latum, valvis ad semina convexis, inter semina angustioribus planis.—*Benth. Fl. Austral.* ii. 397.

Hab. South-east Australia.

229. A. ALPINA, *F. Muell.! Fragm.* iii. 129; *A. longifoliæ*, var. *Sophoræ*, valde affinis, et forte suadente Muellero (Pl. Vict. ii. 31) varietas montana, diffusa v. divaricata, phyllodiis late et oblique obovatis ¾–1½-pollicaribus, spicis brevibus paucifloris. Cætera conveniunt.—*Benth. Fl. Austral.* ii. 397.

Hab. South-east Australia.

230. A. LONGIFOLIA, *Willd. Spec.* iv. 1052. Erecta, glabra v. junior vix pubescens. Phyllodia late oblonga oblongo-lanceolata v. linearia, recta v. rarius subfalcata, 2- v. plurinervia et reticulato-venulosa, nunc 2–3-pollicaria, nunc duplo longiora. Spicæ sæpissime laxifloræ. Calyx brevis, truncatus. Legumen lineare, sæpius pluripollicare, 2–4 lin. latum, valvis ad semina convexis, inter semina sæpius contractis.—*Bot. Reg.* t. 362; *Bot. Mag.* t. 1827, 2166; *Lodd. Bot. Cab.* t. 678; *Maund, Botanist*, t. 77; *Benth. Fl. Austral.* ii. 397.

Mimosa longifolia, Andr. Bot. Rep. t. 207; Vent. Jard. Malm. t. 62.
M. macrostachya, Poir. Dict. Suppl. i. 61.
M. ensifolia, Sm. ex Steud.
Acacia obtusifolia, A. Cunn.! in Field, New S. Wales, 345.
A. spathulata, Tausch in Flora, 1836, 420.
A. intertexta, Sieb.! in DC. Prod. ii. 454.
Var. SOPHORÆ. Phyllodia lata, obtusa, 2–3-pollicaria. Legumen sæpius crassum, curvum.
Mimosa sophoræ, Labill.! Pl. Nov. Holl. ii. 87, t. 237.
Acacia sophoræ, R. Br.! in Ait. Hort. Kew. ed. 3, v. 462; Lodd. Bot. Cab. t. 1351.
Var. MUCRONATA. Phyllodia angusta, obtusa, 1½–2½-pollicaria.
A. mucronata, Willd. Enum. Hort. Berol. Suppl. 68 (nomen tantum); Wendl. Comm. Acac. 46, t. 12, Bot. Mag. t. 2747.
A. dependens, A. Cunn.! Benth. in Hook. Lond. Journ. i. 372.
Var. FLORIBUNDA. Phyllodia angusta, 3–5-pollicaria, quam in præcedentibus tenuiora et acutiora.
Mimosa floribunda, Vent.! Choix, t. 13.
Acacia floribunda, Willd.! Spec. iv. 1051.
A. angustifolia, Lodd. Bot. Cab. t. 763, non Jacq.
A. intermedia, A. Cunn.! in Bot. Mag. t. 3203.
A. decussata, Ten.! Cat. Ort. Napol. 77.
A. dissitiflora, Benth. in Hook. Lond. Journ. i. 371.
Hab. Extratropical East Australia and Tasmania.

231. A. LINEARIS, *Sims! Bot. Mag.* t. 2156. Glabra v. junior vix pubescens. Phyllodia anguste linearia, nunc 4–6-pollicaria nunc duplo longiora vix linea latiora, costa prominula addito interdum nervo utrinque altero. Spicæ longiusculæ, laxæ. Calyx brevis, dentatus. Legumen lineare, pluripollicare, ad 2 lin. latum.—*Lodd. Bot. Cab.* t. 595; *Benth. Fl. Austral.* ii. 399.

A. longissima, Wendl. Comm. Acac. 45, t. 11; Bot. Reg. t. 680.
Hab. Extratropical East Australia and Tasmania.
From a fruiting specimen just received from Mr. C. Prentice, it is possible that the Brisbane form of *A. linearis* may be specifically distinct from the common somewhat variable New South Wales one. In flower Cunningham's fine specimens appear almost identical with some of Sieber's and others; but the pod in Prentice's specimen is regularly contracted between the seeds, whilst it is quite continuous in the few New South Wales specimens in which I have seen it perfect.

C. STENOPHYLLÆ. *Phyllodia lineari-subulata v. anguste linearia, recta v. curvula, teretia v. crasso-compressa, rarius infra 2 poll. longa. Spicæ densæ v. tenues. Flores sæpius 5-meri, v. in speciebus teretifoliis 4-meri.*

* *Spicæ sessiles, sæpius breves.*

232. A. ACIPHYLLA, *Benth.! in Linnæa,* xxvi. 627. Glabra. Phyllodia lineari-subu-

lata, rigida, pungenti-mucronata, 2–4-pollicaria, teretia, sub lente tenuissime multinervia. Spicæ 3 lin. non excedentes. Flores plerique 5-meri. Calyx breviter lobatus. Legumen pollicare, $1\frac{1}{2}$ lin. latum, durum, inter semina leviter contractum.—*Fl. Austral.* ii. 399.

A. leptoneura, var.? *pungens*, Meissn. in Pl. Preiss. i. 12.

Hab. South-west Australia.

The pod is only known from a single loose valve.

233. A. EPHEDROIDES, *Benth.! in Hook. Lond. Journ.* i. 370. Glabra v. junior pubescens. Phyllodia lineari-filiformia, teretia, 2–6-pollicaria, paucinervia v. obtuse 4-gona. Spicæ 3–4 lin. longæ. Flores plerique 4-meri. Calyx breviter lobatus. Legumen immaturum angustissimum.—*Fl. Austral.* ii. 399.

A. filifolia, Benth.! in Hook. Lond. Journ. i. 369.

Hab. South-west Australia.

234. A. BURKITTII, *F. Muell.! Benth. Fl. Austral.* ii. 400. Glabra. Phyllodia linearisubulata, teretia v. subcompressa, 2–3-pollicaria, striato-multinervia. Spicæ 3–4 lin. longæ. Flores plerique 4-meri. Legumen ignotum.

Hab. Extratropical Central Australia.

235. A. MICRONEURA, *Meissn.! in Pl. Preiss.* i. 19. Cinereo-pubescens, mox glabrata. Phyllodia anguste linearia, 2–3-pollicaria, $\frac{1}{2}$–1 lin. lata, rigida, multinervia, costa prominula. Spicæ 3–4 lin. longæ. Flores plerique 4-meri. Calyx breviter dentatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 400.

Hab. South-west Australia.

236. A. CYPEROPHYLLA, *F. Muell.! Benth. Fl. Austral.* ii. 400. Cano-puberula. Phyllodia lineari-subulata, 6–10-pollicaria, teretia v. vix compressa, sub lente striato-multinervia. Spicæ semipollice breviores. Flores plerique 5-meri. Calyx breviter dentatus, sepalis demum solvendis. Legumen ignotum.

Hab. Extratropical East subcentral Australia: desert interior.

237. A. MULTISPICATA, *Benth.! Fl. Austral.* ii. 400. Junior minute sericeo-pubescens, mox glabrata. Phyllodia lineari-subulata, $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longa, rigidula, teretia, prominule paucinervia et sulcata. Spicæ laxiusculæ, $\frac{1}{2}$–$\frac{3}{4}$-pollicares. Flores plerique 4-meri. Calyx pubescens, breviter lobatus. Ovarium tomentosum. Legumen ignotum.

Hab. South-west Australia.

(See also 245. *A. brachystachya*, which has sometimes sessile spikes.)

** *Spicæ pedunculatæ.*

238. A. PITYOIDES, *F. Muell.! in Journ. Linn. Soc.* iii. 135. Glabra. Phyllodia lineari-subulata, rigidula, 2–4-pollicaria, teretia, enervia v. sub lente tenuissime multinervia. Spicæ tenues, densifloræ. Flores plerique 5-meri. Calyx profunde lobatus v. in sepala distincta solvendus. Legumen elongatum, subplanum, 1–$1\frac{1}{2}$ lin. latum, curvum v. tortum, inter semina leviter contractum.—*Benth. Fl. Austral.* ii. 400.

Hab. Tropical North and North-east Australia: desert interior.

239. A. XYLOCARPA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 370. Glabra, subviscida. Phyllodia lineari-subulata, 2–4-pollicaria, rigidula, teretia v. rarius compressa,

obscure 1-nervia. Spicæ tenues, densifloræ. Flores plerique 5-meri. Calyx breviter lobatus. Legumen subteres v. leviter compressum, 1½–3-pollicare, apicem versus 3–4 lin. latum et crassum, basin versus attenuatum, valvis sublignosis striatis, ab apice elastice revolutis, intus inter semina septatum.—*Fl. Austral.* ii. 401.

A. orthocarpa, F. Muell.! in Journ. Linn. Soc. iii. 136.

A. tenuissima, F. Muell.! l. c. 135, phyllodiis longioribus tenuioribus; legumen ignotum.

Hab. Tropical North-west Australia.

240. A. GONOCARPA, *F. Muell.! in Journ. Linn. Soc.* iii. 136. Glabra, junior viscida. Phyllodia plana, angustissime linearia, 1½–2- rarius 3-pollicaria, prominule 1-nervia. Spicæ tenues, densissimæ. Flores minimi, plerique 5-meri. Sepala distincta, anguste linearia. Legumen durum, sublignosum, 1½–2-pollicare, ad 3 lin. latum, marginibus elevatis acutangulis, valvis dehiscentia ab apice revolutis, intus inter semina septatum.—*Benth. Fl. Austral.* ii. 401.

Hab. Tropical North Australia.

241. A. ONCINOPHYLLA, *Lindl.! Sw. Riv. App.* 15. Glabra v. leviter viscido-pubescens. Phyllodia lineari-subulata, 3–5-pollicaria, ad lineam lata, crassa, rigidula, prominule 3-nervia. Spicæ densæ. Flores plerique 5-meri. Calyx lobatus, sepalis subsolutis. Legumen (*ex Meissn.*) lineare, subtortuosum, 1–1½-pollicare, 2 lin. latum, villosulum.—*Bot. Mag.* t. 4353; *Benth. Fl. Austral.* ii. 401.

Hab. South-west Australia.

242. A. DREPANOCARPA, *F. Muell.! in Journ. Linn. Soc.* iii. 137. Glabra, junior resinosa. Phyllodia anguste linearia, 2–4-pollicaria, 1–2 lin. lata, costa prominula et utrinque tenuiter 1–2-nervia. Spicæ tenues. Flores plerique 5-meri. Calyx lobatus. Legumen 1½–3-pollicare, 1½–2 lin. latum, planum, crassum, marginibus crassis, oblique venosum, valvis dehiscentia elastice revolutis.— *Benth. Fl. Austral.* ii. 402.

Hab. Tropical North Australia.

243. A. ARIDA, *Benth.! in Hook. Lond. Journ.* i. 370. Glabra v. tenuiter canescens. Phyllodia anguste linearia, 2–4-pollicaria, 1–2 lin. lata, plana, crassa, obscure 3-nervia. Spicæ tenues, densæ. Flores minimi, plerique 5-meri. Calyx breviter lobatus. Legumen planum, crassum, fere 4 poll. longum, 3 lin. latum, basin versus attenuatum, valvis sublignosis, dehiscentia elastice revolutis.—*Fl. Austral.* ii. 402.

Hab. Tropical North-west Australia.

244. A. ANEURA, *F. Muell.! in Linnæa*, xxvi. 627. Minute cano-pubescens. Phyllodia anguste linearia, plana, crassa, sæpius 1½–3-pollicaria, 1–1½ lin. lata, nunc anguste oblonga v. subteretia, sub lente vix obscure multinervia. Spicæ ½–¾-pollicares. Flores plerique 5-meri. Sepala distincta, angustissima. Legumen planum, tenue, 1–1½-pollicare, ad 4 lin. latum, basi contractum, marginibus angustissime alatis.—*Benth. Fl. Austral.* ii. 402.

Hab. Extratropical Central and South Australia: desert interior.

245. A. BRACHYSTACHYA, *Benth.! Fl. Austral.* ii. 403. Subglauca v. canescens. Phyllodia lineari-subulata, leviter compressa, rigida, sub lente striato-multinervia. Spicæ

brevissime pedunculatæ v. subsessiles, ovoideæ, 2–3 lin. longæ. Flores plerique 5-meri. Sepala distincta. Legumen ignotum. An *A. aneuræ* var. ?

Hab. Extratropical East Australia : desert interior.

D. Falcatæ. *Phyllodia sæpius elongata v. ampla, plus minus falcata, apice basique contracta, nervis venisque crebris parallelis,* 1–3 *pluribusve sæpius magis prominulis, tenuioribus sæpe anastomosantibus. Spicæ tenues, sæpius densifloræ. Flores plerique* 5-*meri.*

* *Legumen ubi notum angustum, seminibus longitudinalibus.*

246. A. CONSPERSA, *F. Muell. ! in Journ. Linn. Soc.* iii. 140. Laxe puberula. Stipulæ parvæ, fuscæ. Phyllodia lanceolata, subfalcata, 2–3-pollicaria, 2–4 lin. lata, 1–3-nervia et crebre parallele venulosa. Flores ignoti. Legumen lineare, rectum v. subfalcatum, $1\frac{1}{2}$ lin. latum, crassiusculum, valvis duris leviter convexis.—*Benth. Fl. Austral.* ii. 403.

Hab. Tropical North Australia.

247. A. DORATOXYLON, *A. Cunn. ! in Field, New S. Wales,* 345. Glabra, cinerascens. Phyllodia elongato-linearia, subfalcata, 4–8-pollicaria, 2–3, rarius 4 lin. lata, crassiuscula, tenuiter multinervia, costa prominula. Spicæ densiusculæ. Calyx sinuato-dentatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 403.

Hab. Extratropical and subtropical East and Central Australia : desert interior.

248. A. ACUMINATA, *Benth. ! in Hook. Lond. Journ.* i. 373. Glabra v. junior sericeo- v. aureo-pubescens. Phyllodia elongato-linearia, subfalcata, 3–10-pollicaria, 2–3 lin. lata, tenuiter multinervia, costa prominula. Spicæ densiusculæ. Flores quam in *A. doratoxylo* majores. Sepala facile solvenda. Legumen lineare, 2–$2\frac{1}{2}$ lin. latum, valvis ad semina convexis, inter semina subcontractum.—*Fl. Austral.* ii. 404.

A. doratoxylon, Meissn. ! in Pl. Preiss. i. 19, vix A. Cunn.

A. Oldfieldii, F. Muell. ! Fragm. Phytogr. Austral. iv. 7.

Hab. South-west Australia. Possibly a western variety only of *A. doratoxylon.*

249. A. STEREOPHYLLA, *Meissn. ! in Pl. Preiss.* ii. 203. Glaberrima. Phyllodia linearia, subfalcata, 3–5-pollicaria, $1\frac{1}{2}$–3 lin. lata, crassa, rigidula, tenuiter multinervia. Spicæ densæ, subsessiles. Sepala distincta v. vix cohærentia. Legumen ignotum.—*Benth. Fl. Austral.* ii. 404.

Hab. South-west Australia.

250. A. SIGNATA, *F. Muell. ! Fragm. Phytogr. Austral.* iv. 7. Glabra, glauca. Phyllodia lineari-lanceolata, 2–5-pollicaria, obtusa, basi contracta, rigidula, tenuiter multinervia. Spicæ pedunculatæ. Flores ignoti. Legumen breviter stipitatum, planum, coriaceum, sub-3-pollicare, ad 3 lin. latum, marginibus incrassatis.—*Benth. Fl. Austral.* ii. 404.

Hab. South-west Australia.

The foliage of the last three species is nearly identical.

251. A. DELIBRATA, *A. Cunn. ! Benth. in Hook. Lond. Journ.* i. 374. Junior sericeo-pubescens, glabrescens. Phyllodia lineari-lanceolata, falcata, 4–6-pollicaria, medio 2–5 lin. lata, haud crassa, nervis ad 3 prominulis, pluribusque tenuibus hinc inde anastomo-

santibus. Flores ignoti. Legumen sub-3-pollicare, $2\frac{1}{2}$–3 lin. latum, valvis planis v. ad semina convexis, marginibus incrassatis.—*Fl. Austral.* ii. 404.

Hab. Tropical North-west Australia.

252. A. OLIGONEURA, *F. Muell.! in Journ. Linn. Soc.* iii. 139. Glabra. Phyllodia anguste lanceolata, falcata, 4–6-pollicaria, $\frac{1}{2}$–$\frac{3}{4}$ poll. lata, venis ad 3 prominulis, paucis tenuioribus, venulis reticulatis. Spicæ pedunculatæ, tenues, densifloræ. Calyx sinuato-dentatus. Legumen ignotum.—*Benth. Fl. Austral.* ii. 405.

Hab. Tropical North and North-west Australia.

Possibly the same as *A. delibrata*.

253. A. TORULOSA, *Benth.! in Journ. Linn. Soc.* iii. 139. Glabra. Phyllodia linearilanceolata, falcata, 4–8-pollicaria, medio 3–4 lin. lata, coriacea, nervis 3–5 prominulis numerosisque tenuibus parallelis. Spicæ brevissime pedunculatæ, densiusculæ. Sepala distincta v. basi subcoalita, angusta. Legumen pluripollicare, moniliforme, valvis ad semina convexis, 3 lin. latis, inter semina valde constrictis.—*Fl. Austral.* ii. 405.

Hab. Tropical North and North-east Australia.

The foliage is very nearly the same as that of *A. julifera* and some others of this series.

254. A. JULIFERA, *Benth.! in Hook. Lond. Journ.* i. 374. Glabra excepta inflorescentia. Phyllodia anguste lanceolata, falcata, 4–6-pollicaria, medio 3–6 lin. lata, nervis 1–3 marginibusque nerviformibus prominulis, tenuioribus numerosis. Spicæ densæ, breviter pedunculatæ. Calyx lobatus, pubescens. Legumen $1\frac{1}{2}$–2 lin. latum, spiraliter contortum, gyris numerosis irregulariter laxis v. in cylindrum brevem confertis.—*Benth. Fl. Austral.* ii. 405.

255. A. SOLANDRI, *Benth.! Fl. Austral.* ii. 406. Glabra v. junior subsericea. Phyllodia anguste lanceolata, falcata, 4–6-pollicaria, 3–4 lin. lata, nervis 1–3 prominulis numerosisque tenuioribus parallelis. Spicæ 2–3-pollicares, tenues, dissitifloræ. Calyx truncatus. Legumen ignotum.

Hab. Subtropical or tropical East Australia.

The inflorescence is that of *A. linearis*, but the 5-merous flowers and the phyllodia those of *A. julifera*.

256. ? A. LEPTOSTACHYA, *Benth.! Fl. Austral.* ii. 406. Subglabra v. minute cano- v. argenteo-pubescens. Phyllodia linearia v. lanceolata, sæpius falcata, 1–2 rarius 3 poll. longa, 1–5 lin. lata, tenuiter et subæqualiter multinervia. Spicæ tenues, longiusculæ, floribus sæpius dissitis. Calyx brevis, truncatus. Legumen ignotum.

Hab. Tropical East Australia.

This may possibly be one of the group with transverse seeds.

257. A. GLAUCESCENS, *Willd. Spec.* iv. 1052, *et Hort. Berol.* t. 101. Cinereo-glaucescens v. junior sericeo-flavescens, rarius ab initio glabra. Ramuli obscure angulati, mox teretes. Phyllodia oblongo-falcata v. lanceolata, 4–6-pollicaria, medio $\frac{1}{2}$–1 poll. lata, coriacea, striato-multinervia. Spicæ 1–2-pollicares, densiusculæ v. laxifloræ. Calyx pubescens, truncatus v. sinuato-dentatus. Legumen lineare, elongatum, ad 2 lin. latum, valde contortum v. irregulariter subspirale.—*Benth. Fl. Austral.* ii. 406.

Mimosa glaucescens, Poir. Dict. Suppl. i. 61.

M. binervis, Wendl. Bot. Beob. 56, ex ejusd. Comm. Acac. 53.

Acacia homomalla, Wendl. Comm. Acac. 49, t. 13, ex ic. et descr.
A. cinerascens, Sieb. ! in DC. Prod. ii. 454 ; Bot. Mag. t. 3174
A. leucadendron, A. Cunn. ! Benth. in Hook. Lond. Journ. i. 374.
Hab. Extratropical (and subtropical ?) East Australia.

258. A. CUNNINGHAMI, *Hook. ! Ic. Pl.* t. 165, *non G. Don.* Glabra v. cano-pubescens, ramulis insigniter acutangulis. Phyllodia falcato-oblonga v. lanceolata, semipedalia et 1–1½ poll. lata v. in ramis sterilibus majora, nervis numerosis parallelis, 3–5 magis prominulis, 1–2 ad basin cum margine confluentibus. Spicæ longiusculæ, densæ. Calyx sinuato-dentatus. Legumen lineare, flexuosum v. contortum, 1–2 lin. latum.—*Benth. Fl. Austral.* ii. 407.

A. longispicata, Benth. in Mitch. Trop. Austr. 298.
Hab. Extratropical and subtropical Australia.

259. A. LEPTOCARPA, *A. Cunn. ! Benth. in Hook. Lond. Journ.* i. 376. Glabra, ramulis vix angulatis. Phyllodia lanceolato-falcata, 4–6-pollicaria, medio 4–8 lin. lata, nervis tenuibus, ad 3 magis prominulis, numerosis tenuissimis parallelis subdissitis rarius anastomosantibus. Spicæ 1½–2-pollicares, laxiusculæ. Calyx sinuato-dentatus. Legumen lineare, subrectum, pluripollicare, 1½–2 lin. latum, valvis ad semina convexis, inter semina contractum.—*Fl. Austral.* ii. 407.

Hab. Tropical East Australia.

260. A. POLYSTACHYA, *A. Cunn. ! Benth. in Hook. Lond. Journ.* i. 376. Glabra, ramulis vix angulatis. Phyllodia falcato-oblonga v. lanceolata, 6–10-pollicaria, medio 1–1½ poll. lata, nervis tenuibus, 3–5 magis prominulis, numerosis tenuissimis parallelis subdissitis hinc inde anastomosantibus. Spicæ tenues, 1–2-pollicares, laxiusculæ. Calyx sinuato-dentatus. Legumen flexuosum, pluripollicare, 5–6 lin. latum, valvis planis tenuiter coriaceis.—*Fl. Austral.* ii. 407.

Hab. Tropical North and East Australia.
Phyllodia nearly of *A. leptocarpa,* but the pod different.

261. A. HOLOCARPA, *Benth. ! Fl. Austral.* ii. 408. Glabra, ramulis tenuibus teretibus. Phyllodia late falcata 4–5- v. forte 6-pollicaria, medio ½–¾ poll. lata, nervis 2–3 prominulis numerosisque tenuibus parallelis confertissimis. Spicæ subsessiles, tenues, densifloræ. Calyx alte lobatus. Legumen elongatum, tenue, subteres, longitudinaliter striatum, ad 2 lin. diametro.

Hab. Tropical East Australia.
The phyllodia are those of *A. crassicarpa*; but the pod is very different.

** *Legumen ubi notum latiusculum coriaceum v. rarius tenue. Semina valde obliqua v. subtransversa.*

In most species of this group, as in some of the preceding species, the seeds appear to have been embedded in a pulp, which in drying forms spurious dissepiments between them.

262. A. PLECTOCARPA, *A. Cunn. ! Benth. in Hook. Lond. Journ.* i. 375. Glabra sæpeque glauca, ramulis acutangulis. Phyllodia falcato-lanceolata, 4–6-pollicaria, medio 4–8 lin. lata, nervis ad 3 prominulis numerosisque tenuibus parallelis confertis. Spicæ tenues, superiores sæpe paniculatæ. Calyx minute dentatus. Legumen 1½–2-pollicare, 3–4 lin.

latum, planum v. inter margines rectos undulatum, variat tenuius v. crassius.—*Fl. Austral.* ii. 408.

Hab. Tropical North-west Australia.

263. A. PACHYCARPA, *F. Muell.! in Journ. Linn. Soc.* iii. 139. Glabra v. minute glauco-pubescens, ramulis vix angulatis. Phyllodia lineari-lanceolata v. linearia, subfalcata, 3–10-pollicaria, medio 2–4 lin. lata, coriacea, sub lente tenuissime multinervia, nervis rarius 1–3 conspicuis. Spicæ tenues, densiusculæ. Calyx sinuato-dentatus. Legumen 1½–2-pollicare, ad 4 lin. latum, tenuiter coriaceum, inter margines rectos undulatum.—*Benth. Fl. Austral.* ii. 408.

Hab. Tropical North-west Australia.

264. A. TUMIDA, *F. Muell.! in Journ. Linn. Soc.* iii. 144. Glabra, subglauca. Phyllodia falcato-oblonga v. lanceolata, 4–8-pollicaria, medio 1–1½ poll. lata, nervis 5–9 prominulis numerosisque tenuibus parallelis confertis rarius anastomosantibus. Spicæ tenues, densifloræ. Sepala lineari-spathulata, basi breviter connata. Legumen curvum, 1½–3-pollicare, 3–4 lin. latum, ob valvas valde convexas subteres, intus inter semina septatum.—*Benth. Fl. Austral.* ii. 409.

Hab. Tropical North and North-west Australia.

265. A. LOXOCARPA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 377. Glabra, subglauca. Phyllodia longe lanceolata v. linearia, 3–6-pollicaria, medio 3–6 lin. lata, falcata, tenuiter et confertim multinervia, nervis vix anastomosantibus. Spicæ tenues, densifloræ. Calyx sinuato-dentatus. Legumen lineari-cuneatum, supra medium 3 lin. latum, basin versus longe contractum, valvis planis duris oblique venosis, dehiscentia elastice revolutis.—*Fl. Austral.* ii. 409.

Hab. Tropical North Australia.

266. A. ONCINOCARPA, *Benth.! in Hook. Lond. Journ.* i. 378. Glabra v. minute cano-pubescens. Phyllodia lanceolato-falcata, 4–6-pollicaria, medio 6–8 lin. lata, nervis 5–7 tenuiter prominulis, nonnullis basi cum margine confluentibus numerosisque tenuioribus parallelis. Spicæ tenues, laxiusculæ. Calyx sinuato-dentatus. Legumen rectum, apice uncinatum, supra medium 4 lin. latum, basi longe contractum, valvis duris planis oblique venosis.— *Fl. Austral.* ii. 409.

Hab. Tropical North Australia.

267. A. RETINERVIS, *Benth.! in Hook. Lond. Journ.* i. 379, *excl. legumine.* Glabra v. subcanescens. Phyllodia falcato-lanceolata, 3–6-pollicaria, medio 4–6 lin. lata, nervis 3–7 leviter prominulis, venulis sub lente tenuibus longitudinaliter confertissimis et creberrime anastomosantibus. Spicæ tenues, densæ. Calyx lobatus. Legumen ignotum.—*Fl. Austral.* ii. 410.

Hab. Tropical North-west Australia.

268. A. AULACOCARPA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 378. Canescens v. cinereo-glaucescens, demum glabrata, ramulis subtriquetris. Phyllodia falcato-lanceolata, 3–4-pollicaria, medio ad 6 lin. lata, nervis paucis prominulis inferioribus basi cum margine confluentibus numerosisque tenuibus parallelis rarius anastomosantibus.

Spicæ tenues, laxifloræ. Calyx breviter lobatus. Legumen falcato-oblongum, nunc 1–2-pollicare, supra medium $\frac{1}{2}$–$\frac{3}{4}$ poll. latum, nunc dimidio majus, basi longe angustatum, valvis planis crassis duris oblique venosis.—*Fl. Austral.* ii. 410.

Hab. Tropical East Australia.

269. A. CALYCULATA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 379. Glabra v. cinereo-glaucescens, ramulis complanatis acutangulis. Phyllodia falcato-oblonga, 2–3-pollicaria, ad 6 lin. lata, crassiuscula, nervis paucis tenuiter prominulis, numerosisque tenuissimis confertim parallelis vix anastomosantibus. Spicæ tenues. Calyx pubescens, sinuato-dentatus. Legumen immaturum ei *A. aulacocarpæ* simile, planum, durum, oblique venosum.—*Fl. Austral.* ii. 410.

Hab. Tropical East Australia.

270. A. CRASSICARPA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 379. Glabra v. subcanescens, ramulis teretiusculis. Phyllodia falcato-oblonga, 5–8-pollicaria, 1–2 poll. lata, nervis nonnullis prominulis basi cum margine confluentibus, numerosisque tenuissimis parallelis vix v. non anastomosantibus. Spicæ tenues, laxiusculæ. Calyx sinuato-dentatus. Legumen oblongum, 2–3-pollicare, $\frac{3}{4}$–1 poll. latum, basi obliquum, valvis planis crassis duris oblique venosis.—*Fl. Austral.* ii. 410.

Hab. Tropical North and North-east Australia.

271. A. AURICULIFORMIS, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 377. Glabra, glauca. Phyllodia falcato-oblonga, 5–8-pollicaria, 1–2 poll. lata, crebre parallele venulosa, nervis nonnullis basi cum margine confluentibus ut in *A. crassicarpa.* Flores ignoti. Legumen durum, 6–8 lin. latum et oblique venosum, valde contortum v. irregulariter subspirale, margine exteriore sæpe profunde sinuato.—*Benth. Fl. Austral.* ii. 411.

Hab. Tropical North and North-east Australia.

Evidently near the New-Caledonian *A. spirorbis*; and possibly further specimens may show them to be rather varieties only of one species.

272. A. SPIRORBIS, *Labill.! Sert. Austr. Caled.* 69, t. 69. Glabra, subglauca. Phyllodia falcato-oblonga v. lanceolata, 3–4-pollicaria, 3–6 lin. lata, coriacea, tenuissime multinervia. Spicæ elongatæ, laxæ. Calyx sinuato-dentatus. Legumen 4–6 lin. latum, vix venosum, irregulariter spirale, marginibus continuis.

Hab. New Caledonia.

E. Dimidiatæ. *Phyllodia ampla, lata, valde obliqua v. falcata, nervis 3–5 prominentibus inter se distantibus, basi plus minus ad v. prope marginem confluentibus, inter nervos reticulato-pennivenia.*

273. A. LATIFOLIA, *Benth.! in Hook. Lond. Journ.* i. 382. Glabra, glauca, ramulis acutangulis. Phyllodia oblique ovato-rhombea v. falcata, 3–6-pollicaria, $1\frac{1}{2}$–2 poll. lata, nervis 3–5 basi confluentibus. Spicæ laxæ. Flores plerique 4-meri. Calyx truncatus. Legumen (immaturum) planum, marginibus nerviformibus, 2–4-pollicare, ad 3 lin. latum.—*Fl. Austral.* ii. 411.

Hab. Tropical North Australia.

274. A. HOLOSERICEA, *A. Cunn.! in G. Don, Gen. Syst.* ii. 407. Canescens v. sericeo-pubescens, ramulis angulatis. Phyllodia oblique ovali-oblonga, 4–10-pollicaria, 1–4 poll. lata, nervis 3–4 basi confluentibus. Spicæ longæ, densiusculæ. Flores plerique 5-meri. Calyx breviter lobatus. Legumen longe lineare, 2–2½ lin. latum, valde contortum v. subspirale.—*Benth. Fl. Austral.* ii. 411.

A. neurocarpa, A. Cunn.! in Hook. Ic. Pl. t. 168.

Hab. Tropical Australia, from North-west to North-east.

275. A. MANGIUM, *Willd. Spec.* iv. 1053, *ad ic. et descr. Rumph. Herb. Amb.* iii. 123, t. 81. Phyllodia quoad formam et venationem iis *A. holosericeæ* similia, majora 1½-pedalia. Legumen lineare, intricato-contortum. Cætera ignota.

Mimosa laurifolia var. *Mangium,* Poir. Dict. Suppl. i. 62.

Hab. Island of Amboyna (Laytimor) and adjacent islands Oma and Harocha, *Rumphius.*

This tree is only known from Rumphius's figure, taken from a leafy branch without flowers or fruit, gathered in the main island of Amboyna, and from his few descriptive notes of the tree, which, he says, is common in the little islands of Oma and Harocha, all which agree perfectly with the *A. holosericea,* except in the size of the phyllodia, which, he says, attain a foot and a half in breadth (length?), whilst among numerous Australian specimens I have seen none much above half that length. The larger ones, however, may not have been gathered by collectors. If the Amboyna tree should really prove to be identical with the Australian one, Willdenow's name will have to be preferred.

276. A. DIMIDIATA, *Benth.! in Hook. Lond. Journ.* i. 381. Cano-puberula v. subglabra, ramulis vix angulatis. Phyllodia oblique ovato-rhombea, 3–4 poll. longa, 2–3 poll. lata v. in ramis sterilibus duplo majora, nervis 4–5 basi confluentibus. Spicæ 1–2-pollicares, densiusculæ. Calyx in sepala distincta facile solvendus. Legumen rectiusculum, 2–6-pollicare, 2–3 lin. latum, valvis coriaceis convexis.—*Fl. Austral.* ii. 412.

A. dolabriformis, A. Cunn.! in Hook. Ic. Pl. t. 169 non Wendl.

Hab. Tropical North and North-west Australia.

277. A. HUMIFUSA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 382. Diffusa v. prostrata, molliter pubescens. Phyllodia oblique ovato-rhombea v. suborbicularia, 1½–2-pollicaria v. in ramis sterilibus duplo majora, nervis 3–5 basi confluentibus. Spicæ sessiles, oblongæ, densifloræ, semipollice breviores. Calyx lobatus. Legumen rectiusculum, subteres, 1½–3-pollicare, 2½–3 lin. latum, pubescens, valvis coriaceis.—*Fl. Austral.* ii. 412.

Hab. Tropical Australia, from North-west to North-east.

Series 2. BOTRYOCEPHALÆ.

Inermes. Stipulæ minutæ v. 0. Folia bipinnata. Capitula globosa, racemosa, racemis axillaribus v. in paniculam terminalem dispositis. Legumen ubi notum planum, seminibus longitudinalibus, funiculo plicato apice oblique dilatato. Species omnes Australienses.

278. A. ELATA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 383. Junior aureo-sericea,

demum glabrescens. Pinnæ 2–4-jugæ; foliola 8–12-juga, lanceolata, acute acuminata, 1–2-pollicaria. Legumen 4–6-pollicare, ad 6 lin. latum.—*Fl. Austral.* ii. 413.

Mimosa terminalis, Salisb. Prod. 325 ? ex char. nimis brevi.

Hab. Extratropical East Australia.

279. A. PRUINOSA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 383. Glabra, glauca. Pinnæ 2–4- rarius 5-jugæ; glandula petiolaris prominula, a pari inferiore pinnarum distans; foliola 12–20-juga, oblonga v. linearia, obtusa v. vix acutiuscula, semipollicaria v. paullo longiora. Legumen ignotum.—*Fl. Austral.* ii. 413.

A. schinoides, Benth. in Hook. Lond. Journ. i. 383.

Hab. Extratropical East Australia.

280. A. SPECTABILIS, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 383. Glabra, glauca v. ramulis hirtellis. Pinnæ 2–4-jugæ; glandula petiolaris ad pinnarum par infimum depressa v. obscura; foliola 4–8-juga, obovato-oblonga, obtusissima, 4–6 lin. longa, crassiuscula. Legumen 3–4-pollicare, ad 6 lin. latum, glaucum.—*Bot. Reg.* 1843, t. 46; *Benth. Fl. Austral.* ii. 413.

A. chrysobotrys, Meissn. Ind. Sem. Hort. Basil. 1842, ex char. in Walp. Rep. ii. 906.

Hab. Extratropical and subtropical East Australia.

281. A. POLYBOTRYA, *Benth. in Hook. Lond. Journ.* i. 384. Pubescens. Pinnæ 2–3-jugæ; glandula ad basin petioli; foliola 6–10-juga, anguste oblonga, obtusa, crassiuscula, costa margini approximata. Legumen ignotum.—*Fl. Austral.* ii. 414.

Hab. Extratropical East Australia.

282. A. DISCOLOR, *Willd. Spec.* iv. 1068. Glabra v. pubescens. Pinnæ 2–4-jugæ; foliola 10–15-juga, oblonga, obtusa v. acuta, 3–4 lin. longa, rigidula, subtus pallida. Capitula 6–15-flora. Legumen 1–3-pollicare, 5–6 lin. latum.—*Bot. Mag.* t. 1750; *Lodd. Bot. Cab.* t. 601; *Benth. Fl. Austral.* ii. 414.

Mimosa discolor, Andr. Bot. Rep. t. 235.

M. paniculata, Wendl. Bot. Beob. 57.

M. botrycephala, Vent. Jard. Cels. t. 1.

Acacia botrycephala, Desf. Cat. Hort. Par. ed. 3, 300.

A. maritima, Benth.! in Hook. Lond. Journ. i. 384.

A. Sieberiana, Scheele in Linnæa, xvii. 337.

A. angulata, Desv.! Journ. Bot. 1814, iii. 68.

Hab. Extratropical East Australia and Tasmania.

283. A. DECURRENS, *Willd. Spec.* iv. 1072. Glabra v. tomentoso-pubescens. Pinnæ 8–15-jugæ, rarius 5–6-jugæ; foliola multi- (30–40- v. pluri-)juga, linearia, 2–5 lin. longa. Legumen 3–4-pollicare, ad 3 lin. latum, inter semina sæpius contractum.—*Benth. Fl. Austral.* ii. 414.

Mimosa decurrens, Wendl. Bot. Beob. 57; Vent. Jard. Malm. t. 61.

Acacia sulcipes, Sieb. Pl. exs.

A. adenophora, Spreng. Syst. iii. 140.

Var. MOLLIS, Lindl.! Bot. Reg. t. 371. Partes novellæ pube flavescente v. aurea tomentosæ.

A. mollissima, Willd. Enum. Hort. Berol. 1053; Sweet, Fl. Austral. t. 12.

Hab. Extratropical East Australia and Tasmania.

284. A. DEALBATA, *Link, Enum. Hort. Berol.* 445. Omnia *A. decurrentis* var. *mollis*, nisi partes juniores glauco- v. cano-pubescentes nec flavescentes et legumen quoad notum tenuius, 4-5 lin. latum, inter semina vix constrictum.—*Lodd. Bot. Cab.* t. 1928; *Benth. Fl. Austral.* ii. 415.

A. irrorata, Sieb.! in Spreng. Syst. iii. 141

Hab. Extratropical East Australia and Tasmania.

This, the *Silver Wattle*, is regarded as quite distinct from *A. discolor* by Tasmanian botanists. F. Mueller, from the continental forms, unhesitatingly unites it with that species. The pod appears to be different in the two species; but it has been observed only in far too few specimens to judge of the constancy of the character.

285. A. CARDIOPHYLLA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 385. Pubescenti-hirta. Pinnæ 12–15-jugæ, breves; foliola 6–10-juga, ovato-subcordata, $\frac{1}{2}$–$\frac{3}{4}$ lin. longa. Legumen ignotum.—*Fl. Austral.* ii. 415.

Hab. Extratropical East Australia: desert interior.

Readily known by the minute leaflets.

286. A. LEPTOCLADA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 385. Glabra v. glaucescens et hinc inde hispidula. Pinnæ 3–4-jugæ; foliola 6–10-juga, oblonga, coriacea, $\frac{1}{2}$–$1\frac{1}{2}$ lin. longa. Capitula parva, hispida. Sepala distincta. Legumen ignotum.—*Fl. Austral.* ii. 416.

Hab. Extratropical East Australia.

287. A. PUBESCENS, *R. Br.! in Ait. Hort. Kew.* ed. 3, v. 467. Hirsuta. Pinnæ 3–10-jugæ; foliola 6–20-juga, conferta, linearia, obtusa, 1–2 lin. longa, sæpius glabra. Capitula glabra. Calyx sinuato-dentatus. Legumen non vidi.—*Maund, Botanist*, t. 48; *Reichb. Ic. et Descr. Pl.* t. 73; *Benth. Fl. Austral.* ii. 416.

Mimosa pubescens, Vent. Jard. Malm. t. 21; Bot. Mag. t. 1263.

Hab. Extratropical East Australia.

Series 3. PULCHELLÆ.

Frutices inermes v. rarius spinis axillaribus (pedunculis mutatis) armati, nec aculeati. Folia bipinnata. Capitula globosa v. rarius spicæ cylindraceæ, ad axillas pedunculata. Legumen planum, rectum v. falcatum. Species omnes Australienses.

* *Semina longitudinalia. Capitula globosa.*

288. A. PULCHELLA, *R. Br.! in Ait. Hort. Kew.* ed. 3, v. 464. Glabra v. pilis patentibus conspersa v. hirsutissima. Spinæ axillares tenues, rarius desunt. Pinnæ 1-jugæ; foliola 4–7-juga, obovato- v. lineari-oblonga, 1–2 rarius 3 lin. longa. Calyx sinuato-dentatus. Legumen 1–2-pollicare, $1\frac{1}{2}$–$2\frac{1}{2}$ lin. latum.—*Lodd. Bot. Cab.* t. 212; *Paxt. Mag.* iv. 198, *cum ic.*; *Benth. Fl. Austral.* ii. 416.

A. denudata, Lehm.! Meissn. in Pl. Preiss. i. 21, glabra, foliolis paucis.

A. fagonioides, Benth.! in Hook. Lond. Journ. i. 387, glabra v. vix pubescens, foliolis paucis.

A. grandis, Henfr. in Gard. Mag. Bot. iii. 177, cum ic. in Lem. Jard. Fleur. t. 154 repetita, glabra, foliolis numerosioribus.

A. hispidissima, DC. Prod. ii. 455; Bot. Mag. t. 4588 (ic. in Lem. Jard. Fleur. t. 160 repetita), hirsutissima, foliolis angustis.

A. lasiocarpa, Benth.! in Hueg. Enum. 43; hirsuta, legumine villoso.

A. cygnorum, Benth.! in Hook. Lond. Journ. i. 388, eadem, foliolis minoribus.

Hab. South-west Australia.

289. A. MITCHELLI, *Benth.! in Hook. Lond. Journ.* i. 387. Pubescens, inermis. Pinnæ 2–3-jugæ; foliola 3–6-juga, oblonga, obtusa, crassiuscula, 1–2 lin. longa. Sepala distincta v. basi connata. Legumen 1–2-pollicare, $2\frac{1}{2}$–3 lin. latum, marginibus nerviformibus.—*F. Muell. Fl. Vict.* ii. t. Suppl. 12; *Benth. Fl. Austral.* ii. 417.

Hab. South-east Australia.

290. A. PENTADENIA, *Lindl.! Bot. Reg.* t. 1521. Glabra, inermis. Pinnæ 2–5-jugæ; foliola 20–30-juga, oblique ovata v. subrhombea, 1–2 rarius 3 lin. longa. Calyx breviter dentatus. Legumen 1–$1\frac{1}{2}$-pollicare, 2–$2\frac{1}{2}$ lin. latum, marginibus incrassatis, valvis duris elastice revolutis.—*Benth. Fl. Austral.* ii. 417.

A. biglandulosa, Meissn.! in Pl. Preiss. ii. 205.

Hab. South-west Australia.

291. A. GILBERTI, *Meissn.! in Pl. Preiss.* ii. 204. Glabra, inermis. Pinnæ unijugæ; foliola 4–6-juga, oblique oblonga, 4–6 lin. longa. Flores 4-meri, in capitulo pauci. Calyx truncatus. Legumen planum, coriaceum, sublignosum, 3 lin. latum, marginibus latis.—*Benth. Fl. Austral.* ii. 417.

Hab. South-west Australia.

** *Semina transversa. Capitula globosa. Inermes.*

292. A. NIGRICANS, *R. Br.! in Ait. Hort. Kew.* ed. 3, v. 465. Glabra. Pinnæ 1–2-jugæ; foliola 5–10-juga, obovato-lanceolata v. lineari-oblonga, 3–5 lin. longa. Flores 5-meri, in capitulo numerosi. Calyx truncatus. Legumen planum, 1–$1\frac{1}{2}$-pollicare, ad 3 lin. latum, marginibus incrassatis, valvis duris elastice revolutis.—*Bot. Mag.* t. 2188; *Lodd. Bot. Cab.* t. 313; *Benth. Fl. Austral.* ii. 418.

Mimosa nigricans, Labill.! Pl. Nov. Holl. ii. 88, t. 238, non Vahl.

Acacia rutæfolia, Link, Enum. Hort. Berol. ii. 444.

Hab. South-west Australia.

293. A. OBSCURA, *A. DC.! Not.* 6, *Pl. Rar. Jard. Gen.* 23, t. 3. Pubescens v. hirsuta. Pinnæ 1–2-, rarius 3-jugæ. Foliola 5–10-juga, ovata oblonga v. linearia, 2–3 rarius 4 lin. longa. Flores 3-meri, in capitulo 12–15. Calyx truncatus. Legumen planum, pollicare, 3 lin. latum, marginibus incrassatis, valvis elastice revolutis.—*Benth. Fl. Austral.* ii. 418.

A. cycnorum, Hook. Bot. Mag. t. 4653, ic. in Lem. Jard. Fleur. t. 322 repetita.

A. Preissiana, Lehm. Del. Sem. Hort. Hamb. 1842.

Hab. South-west Australia.

294. A. STRIGOSA, *Link, Enum. Hort. Berol.* ii. 444. Pubescens hirsuta v. rarius subglabra. Pinnæ 2-jugæ, rarius 1-jugæ; foliola 1–4-juga, oblonga, obtusa, 1–2 lin. longa. Flores 5-meri, in capitulo 12–15. Legumen planum, marginibus incrassatis, pollicare, 3 lin. latum, valvis elastice revolutis.—*Benth. Fl. Austral.* ii. 418.

A. ciliata, R. Br.! in Ait. Hort. Kew. ed. 3, v. 465, non Willd.

A. Browniana, Wendl. in Flora, 1819, 139.
A. Endlicheri, Meissn. in Pl. Preiss. i. 21.
Hab. South-west Australia.

**** Semina transversa. Spicæ cylindraceæ. Inermes.*

295. A. Drummondii, *Lindl.! Swan Riv. App.* 15. Tenuiter cano-pubescens. Pinnæ 2-jugæ; foliola 2–6-juga, oblongo-linearia, 3–4 lin. longa. Spicæ ½–1-pollicares. Calyx pubescens, lobatus. Legumen subpollicare, ad 3 lin. latum, glabrum v. pubescens, marginibus incrassatis.—*Lem. Jard. Fleur.* t. 378; *Bot. Mag.* t. 5191; *Benth. Fl. Austral.* ii. 419.

A. Candolleana, Meissn.! in Pl. Preiss. ii. 206.

Hab. South-west Australia.

Amongst Maxwell's specimens there appear to be a small-flowered variety, and another with short, almost ovoid spikes, the specimens of both insufficient for correct determination.

Series 4. Gummiferæ.

Frutices v. arbores, stipulis nonnullis v. omnibus spinescentibus, cæterum inermes. Folia bipinnata. Pedunculi monostachyi, axillares, subfasciculati v. ad apices ramorum subracemosi, rarius paniculati. Capitula globosa v. spicæ cylindraceæ. Legumen varium.

When the spines or prickles are developed, the three series, *Pulchellæ*, *Gummiferæ*, and *Vulgares*, are readily enough distinguished: the first have abortive peduncles converted into spines, the second have their stipules spinescent, in both cases without prickles; and the *Vulgares* have infrastipular or scattered prickles without spines. But the majority of the *Pulchellæ* are entirely unarmed; they are, however, all Australian, with a peculiar bushy habit. Of the *Gummiferæ*, it is very rare to see a specimen with the hardened or prickly stipules entirely undeveloped; and I believe the *A. choriophylla* is the only one in which I could not at first detect them, and hesitated whether to refer it to the *Gummiferæ* or to the *Vulgares*; but even here I have found a few minute pungent pointed stipules. Several of the *Vulgares* are occasionally, and perhaps one or two species entirely, without prickles; but these are tropical or subtropical American, and not likely to be confounded with the Australian *Pulchellæ*. On the other hand the spinescent stipules of the *Gummiferæ*, when recurved or dilated at the base, as in *A. Mauroceana*, require to be very carefully distinguished from the infrastipular prickles of some of the *Vulgares*.

Subseries 1. Summibracteatæ. *Bracteæ exteriores in involucrum annulare dentatum connatæ, ad apicem pedunculi capitulo arcte approximatum v. parum distans. Capitula globosa. Legumen crassum, turgidum v. rarius planum, non v. vix dehiscens, intus pulpa v. substantia suberoso-spongiosa semina segregante farctum.*

The species of this group, especially the *A. farnesiana*, have been proposed as a distinct genus by Wight and Arnott under the name of *Vachellia*, by Gasparrini under that of *Farnesia*, by E. Meyer under that of *Aldina*, and have been more or less taken up as a genus or subgenus by several others. But they are very unnaturally separated from other *Gummiferæ*; and a nearly similar pod, the only character relied on, occurs in some of the Australian *Phyllodineæ*. Grisebach includes in his section *Vachellia* the *A. arabica*, which has the pod quite continuous inside.

* *Americanæ v. Cosmopolitanæ.*

296. A. pennatula, *Benth.! in Hook. Lond. Journ* i. 390. Tomentoso-pubescens v.

sublanata. Spinæ stipulares minores conico-subulatæ ad 2 lin. longæ, auctæ semipollicares basin versus valde dilatatæ. Pinnæ 20–60-jugæ; foliola 20–30-juga, conferta, $\frac{3}{4}$–$1\frac{1}{2}$ lin. longa. Legumen pubescens v. demum glabratum, oblongum, rectum v. vix curvum, $2\frac{1}{4}$–$3\frac{1}{2}$-pollicare, $\frac{3}{4}$–1 poll. latum, crassissimum, continuum.

Inga pennatula, Cham. et Schlecht.! in Linnæa, v. 593.

Hab. Tropical America: Mexico, *Schiede and Deppe*, *Graham*, *Hartweg*, *Bourgeau*, n. 2912; *Sumichrast*, n. 1770; Nicaragua, *Œrsted*.

297. A. MACRACANTHA, *Humb. et Bonpl.! in Willd. Spec.* iv. 1080. Pubescens v. rarius glabra. Spinæ stipulares minores tenues, auctæ 1–3-pollicares parum dilatatæ teretes v. rarius angulatæ v. supra concavæ. Pinnæ 10–60-jugæ; foliola 20–30-juga; sæpius conferta, $\frac{3}{4}$–$1\frac{1}{2}$ rarius 2 lin. longa. Legumen brevissime pubescens, subteres v. crasso-compressum, longitudinaliter (demum obscure) reticulato-venosum, rectum v. curvum, continuum v. partim v. undique moniliforme, 2–4 poll. longum, 3–6 lin. latum. —*Kunth, Mim.* t. 28; *Griseb. Fl. Brit. W. Ind.* 221.

Mimosa lutea, Mill.! Dict. n. 18.

M. macracantha, Poir. Dict. Suppl. i. 78.

Acacia flexuosa, Humb. et Bonpl.! in Willd. Spec. iv. 1082 (glabrior).

Mimosa flexuosa, Poir. Dict. Suppl. i. 79.

Acacia obtusa, Humb. et Bonpl.! in Willd. Spec. iv. 1087 (pubescens).

Mimosa obtusa, Poir. Dict. Suppl. i. 82.

A. punctata, Humb. et Bonpl. in Willd. Spec. iv. 1084, ex char. et descr.

A. Humboldtii, Desv. in Ham. Prod. Pl. Ind. Occid. 60.

Mimosa atomaria, Poir. Dict. Suppl. i. 81.

Mimosa pellacantha, Meyen!, Reise, i. 445 (pubescens).

Acacia pellacantha, Vog. in Pl. Meyen. 45

A. macracanthoides et *A. subinermis*, Bert.! in DC. Prod. ii. 463 (glabrescentes).

A. aroma, Gill.! in Hook. Bot. Misc. iii. 206 (subglabra).

A. microcephala, Macfad. Fl. Jam. i. 316 (glabrescens).

Hab. Tropical and southern subtropical America, chiefly western and near the sea, sent by very numerous collectors. Jamaica, Vera Cruz, and Central America, Galapagos Islands, Caraccas, and Santa Marta; Guayaquil, Lima, and other parts of the western coast, Bolivia, *Weddell*, *D'Orbigny*, n. 493, *Mandon*, n. 755, Tucuman, *Tweedie*, San Juan, *Gillies*.

I have followed Grisebach in uniting all the above supposed species, notwithstanding the apparent differences in indumentum, in the spines and even in the pod; for I have been unable to detect any concordance in these characters, or any constancy in any of them. The enlargement of the spines is now known to be very inconstant on the same individual in almost every species of *Gummiferæ*, although generally the peculiar form they assume when enlarged is fairly constant in each one. In *A. macracantha*, however, they appear to be in some specimens rather slender and terete, even when 2 inches long; in others, thicker, more angular, and even slightly channelled on the upper side, as in Kunth's figure; and both forms occur in different specimens from Guayaquil, the station of the original *A. macracantha*, without any other differences. The pubescent *A. macracantha* and *A. pellacantha*, from the west coast, and *A. obtusa*, from Caraccas, appear to me to be quite identical with the pubescent Jamaica form. The more glabrous specimens include the *A. macracanthoides* and *A. subinermis*, Bert. (distinguished by the enlarged or unenlarged spines), and *A. microcephala*, Macfad., all from Jamaica, the *A. flexuosa*, from Caraccas, and some of the Guayaquil and other West-Coast specimens. The southern

extratropical specimens, or *A. aroma*, Gill., are more perfectly glabrous; but I can detect no other difference. Some of the Jamaican specimens are remarkable for the great length of their leaves and the increased number of pinnules, the leaflets remaining the same; but this, again, appears to be only a difference in degree, without any accompanying character. With regard to the pod, it is in some specimens regularly moniliform, much contracted between every seed, and flat, in others quite continuous and terete, without any contraction, making it very difficult to conceive that the two can belong to one species; but in other specimens even these characters are variable; sometimes the same pod is moniliform in a portion of its length, continuous in the remainder; and the flat pods (as in *Prosopis juliflora*) appear to be the unripe state, or sometimes an imperfectly developed although ripe state. Many specimens are also, as usual, without any pod; and I have been quite unable, in that state, to sort them into distinct varieties.

Mimosa indica, Poir. Dict. Suppl. 1. 80, from a specimen in the Munich herbarium, from the Jardin des Plantes of Paris, appears to be the *A. macracantha*; but the flowers and fruit being unknown, it must at any rate be erased from the list of species.

298. A. COCHLIACANTHA, *Humb. et Bonpl.! in Willd. Spec.* iv. 1081. Minute canotomentella, glabrescens. Spicæ stipulares minores tenues, auctæ ½–1-pollicares, valde dilatatæ, lanceolato-concavæ. Pinnæ 8–20-jugæ; foliola 10–25-juga, conferta, linearia, ½–1¼ lin. longa. Pedunculi filiformes. Legumen ignotum.—*Kunth! Mim.* 93, t. 29.

Mimosa cochliacantha, Poir. Dict. Suppl. i. 78.

Hab. Tropical America: Guayaquil, *Herb. Pavon, Humboldt and Bonpland.*

Very near the slender varieties of *A. macracantha*; but the flower-heads are much smaller, on very slender peduncles; and the flowers are said to be white, besides the peculiar form assumed by the enlarged spines.

A. cymbacantha, Zuccar.! in. Herb. Monac., from Mexico, Karwinski, may be the same species with very much larger spines, at least 1 in. long and ½ in. broad.

299. A. TORTUOSA, *Willd. Spec.* iv. 1083. Pubescens v. glabriuscula. Spinæ crassæ, auctæ teretes pollicares longioresque. Pinnæ 3–8-jugæ; foliola 10-20-juga, linearia, 2–3 lin. longa. Legumen brevissime pubescens, subteres, 3–4-pollicare, 3–4 lin. latum, rectum v. curvum, continuum v. moniliforme, obscure longitudinaliter venosum.

Mimosa tortuosa, Linn. Spec. 1505.

M. salinarum, Rohr! in Herb. Banks. non Vahl.

Acacia albida, Lindl. Bot. Reg. t. 1317, non Del.

Acacia leucacantha, Berter. in Spreng. Syst. iii. 144.

Prosopis microphylla, H. B. et K., Nov. Gen. et Sp. vi. 308, ex descr.

Hab. Tropical America: Jamaica, Danish Islands, *Œrsted*; Venezuela, *Fendler*; Guayaquil, *Hartweg* and others; Galapagos, *Darwin, Scouler*; Costa Rica, *Œrsted*; Mexico, *G. J. Graham, Aschenborn, Emory's Expedition*, n. 329, and others; but several of the Mexican specimens uncertain for want of the pod.

The foliage approaches that of some forms of *A. farnesiana*, but is more rigid, with larger and fewer leaflets; the pod is nearer to that of *A. macracantha*.

300. A. PLATYACANTHA, *Schlecht. in Linnæa*, xii. 565. Aculei stipulares gemini, non connati, triangulares, subrecti, fusci. Pinnæ 5–6-jugæ; foliola 12–15-juga, pubescentia, lineam longa. Petiolus glandulosus. Stipellæ in pinnarum rhachi recurvæ. Capitula axillaria, pedunculata, cum staminibus 6 lin. diametro. Corolla lineam longa. Legumen 3–4 poll. longum, ½ poll. latum, fere glabrum, crassiusculum, carnosum, indehiscens?, seminibus septis interstinctis.

Hab. Tropical America: Mexico, Mineral del Monte, *Ehrenberg*.

I have not seen this species; the fruit, as described, and most of the characters are those of *A. tortuosa*, in which, however, the stipular spines are always more or less confluent at the base.

301. A. ATRAMENTARIA, *Benth.! in Hook. Lond. Journ.* i. 392. Glaberrima, glaucescens. Spinæ validæ, majores (in speciminibus suppetentibus) vix semipollicares. Pinnæ 2–7-jugæ; foliola 15–20-juga, linearia, 2–3 lin. longa. Legumen glaberrimum, glaucum, curvum, crasso-compressum, 3–4-pollicare, 4–6 lin. latum, valvis demum convexis, oblique sublongitudinaliter venosis.

Prosopis astringens, Gill.! in Hook. Bot. Misc. iii. 204.

Hab. Extratropical South America: Mendoza and San Juan.

The foliage is that of the glabrous forms of *A. tortuosa*; but the pod appears to be sufficiently different to characterize it as a distinct species.

302. A. FARNESIANA, *Willd. Spec.* iv. 1083. Glabra v. puberula. Spinæ tenues, teretes, minores 2–4 lin., auctæ semipollicares v. paullo longiores. Pinnæ 2–8- vulgo 4–5-jugæ; foliola 10–25-juga, linearia, ad 2 lin. longa. Legumen oblongum cylindraceum v. fusiforme, crassum, turgidum, rectum v. curvulum, glabrum, 2–3-pollicare, $\frac{1}{2}$–$\frac{3}{4}$ poll. latum et crassum.—*Benth. Fl. Bras. Mim.*; *Fl. Austral.* ii. 419; *Oliv. Fl. Trop. Afr.* ii. 346; *Bedd. Fl. Sylv.* t. 52.

Mimosa farnesiana, Linn. Spec. 1506.

Vachellia farnesiana, Wight et Arn. Prod. Fl. Penins. 272; Wight, Ic. t. 300.

Farnesia odora, Gaspar. Descr. Nuov. Gen. Leg. 1836, cum ic.

Mimosa scorpioides, Forsk. Fl. Æg. p. lxxvii., nomen tantum.

Acacia pedunculata, Willd. Spec. iv. 1084.

Mimosa pedunculata, Poir. Dict. Suppl. i. 81.

A. edulis, Humb. et Bonpl. in Willd. Enum. Hort. Berol. 1056.

A. acicularis, Willd.! Enum. Hort. Berol. 1056.

A. leptophylla, DC.! Cat. Hort. Monsp. p. 74; Prod. ii. 472, absque fl. et fr.

A. lenticellata, F. Muell.! in Journ. Linn. Soc. iii. 147.

Hab. Widely spread over the tropical and subtropical regions of the New and the Old World, but so generally cultivated for the perfume of its flowers and so frequently established as an escape from cultivation, that it is difficult to determine where it is really indigenous. It appears, however, to be so in Western America, from northern Chili to Texas, not, perhaps, in Brazil nor in Guiana; abundant in tropical and subtropical northern-central Australia, and in the interior of north-eastern Australia, and perhaps also really indigenous in south tropical Africa, but introduced only into East India, northern tropical Africa, and the Mediterranean region.

A. Burmanniana, DC. Prod. ii. 461, insufficiently described from two specimens which Burman had erroneously referred to *A. tortuosa* and to *A. cæsia*, is most probably referrible to *A. farnesiana*.

303. A. CAVENIA, *Hook. et Arn.! Bot. Beech.* 21. Vix ab *A. farnesiana* distinguenda foliolis vix semilinea longioribus et legumine breviore, et verisimiliter illius speciei varietas.—*Colla, Pl. Chil.* t. 12, *in Mem. Acad. Torin.* xxxvii.; *Benth. Fl. Bras. Mim.*

Mimosa cavenia, Molin. Hist. Chil. 163.

A. aromatica, Pœpp. Pl. Exs. n. 177.

A. adenopa, Hook. et Arn.! in Hook. Bot. Misc. iii. 206.

Hab. Extratropical South America: Buenos Ayres and Chili, and apparently also in the Mexicano-Texan region, passing perhaps gradually into the normal form of *A. farnesiana*; but the specimens seem insufficient for precise determination, and probably the whole *A. cavenia* will ultimately be referred as a variety to *A. farnesiana*.

304. A. ACUIFERA, *Benth.! in Hook. Lond. Journ.* i. 496. Glabra. Spinæ tenues, minores brevissimæ, auctæ rectæ subulatæ $\frac{1}{2}$–$\frac{3}{4}$-pollicares. Pinnæ 1-jugæ; foliola 10–12-juga, oblonga, obtusa, nitidula, 3–4 lin. longa. Legumen valde arcuatum v. circinatum, glabrum, immaturum crassum, turgidum, 1 lin. latum.—*Griseb. Fl. Brit. W. Ind.* 222.

Hab. Bahamas, *Swainson*; Turk's Island, *Hjalmarsen.*

Foliorum petiolus communis 3–6 lin. longus, glandula stipitata. Pinnæ 1–1$\frac{1}{2}$-pollicares. Foliola rigidula, costa subcentrali prominula. Pedunculi folio subæquilongi. Capitula iis *A. farnesianæ* minora. Flores glaberrimi, nitiduli. Corolla calyce duplo longior. Stamina corolla duplo longiora, filamentis interioribus basi irregulariter connatis.

305. A. CHORIOPHYLLA, *Benth.! in Hook. Lond. Journ.* i. 495. Glabra. Spinæ minimæ v. 0. Pinnæ 1–2- rarius 3-jugæ. Foliola 3–5-juga, oblongo-elliptica v. ovalia, obtusissima, $\frac{1}{2}$–1-pollicaria, nitidula. Legumen oblongo-falcatum, glabrum, turgidum, 2-pollicare, $\frac{3}{4}$ poll. latum.—*Griseb. Fl. Brit. W. Ind.* 222.

Hab. Bahamas, *Swainson.*

Specimina siccitate nigrescunt. Stipulæ acumine minuto pungente vix conspicuæ, v. interdum omnino deesse videntur. Foliorum petiolus communis $\frac{1}{2}$–1-pollicaris, glandula depressa obscura. Foliola 4–6 lin. lata, costa subcentrali subtus prominula. Pedunculi fasciculati, crassiusculi, subpollicares. Bracteæ connatæ, iis præcedentium similes, ad apicem pedunculi sitæ. Capitula densissima, ad 3 lin. diametro. Bracteæ in capitulo anguste lineares, apice spathulatæ. Legumen eo *A. farnesianæ* brevius et latius, pulpa ut videtur more præcedentium farctum.

** *Africanæ.*

306. A. GIRAFFÆ, *Willd. Enum.* 1054. Spinæ auctæ sæpe validæ longæ, albæ v. fuscescentes. Folia glabra; pinnæ 1–6-jugæ; foliola 8–15-juga, lineari-oblonga, 2–4 lin. longa, obtusa, rigide coriacea. Legumen ovatum v. oblongum, demum turgidum, arcuatum v. rectiusculum, cano-tomentosum, 3–4 poll. longum, $\frac{3}{4}$–1 poll. latum.—*Burch.! Trav.* ii. 240; *Harv. et Sond. Fl. Cap.* ii. 280.

A. erioloba, E. Mey.! Comm. Pl. Afr. Austr. 171.

Hab. Extratropical South Africa: towards Namaqualand, where it is more than any other species known under the name of *Camelthorn.*

I had at first thought that E. Meyer's plant might be distinguished by its more slender whiter thorns and probably by the pod; but I now find that the pod is said to be tomentose also in the original species. Burchell gives a very good figure of the general aspect of the tree; and a branch with a pod are very well figured in the plate of a *Loxia* in Paterson's Travels.

307. A. SIEBERIANA, *DC.! Prod.* ii. 463. Pallida v. glaucescens, glabra v. subtomentella. Spinæ auctæ albæ. Pinnæ 10–30-jugæ; foliola 20–40-juga, oblongo-linearia, obtusa, rigidula, 1$\frac{1}{2}$–2 lin. longa. Legumen rectum v. curvum, glabrum, 6–7-pollicare, ad $\frac{3}{4}$ poll. latum.—*Oliv. Fl. Trop. Afr.* ii. 347.

A. flexuosa, Sieb.! Pl. Seneg. Exs. n. 43.

A. Sing, Guill. et Perr.! Fl. Seneg. 251.

Hab. Western tropical Africa.

Very near the more glabrous forms of the American *A. macracantha*, but with whiter spines, a paler more rigid foliage, and much broader and thicker glabrous pod. The annular bract is often a little below the summit of the peduncle.

308. A. HÆMATOXYLON, *Willd. Enum. Hort. Berol.* 1056. Cano-tomentosa. Spinæ auctæ longæ, tenues. Pinnæ 8–19-jugæ, vix 4 lin. longæ; foliola 18–24-juga, imbricata, obtusa, vix $\frac{1}{4}$ lin. longa. Legumen lineare, falcatum, demum subtereti-tomentosum, 3–4 lin. latum.—*Harv. et Sond. Fl. Cap.* ii. 280.

A. atomiphylla, Burch.! Trav. i. 341.

Hab. Extratropical South Africa.

A species readily known by the minute crowded leaflets.

Subseries 2. Medibracteatæ. *Bracteæ exteriores in involucellum annulare dentatum connatæ, in medio pedunculo paullo altius v. inferius situm, persistens v. caducum, rarius deficiens. Capitula globosa, rarius ovata. Legumen sæpissime (interdum tardius) bivalve, intus continuum v. valvis subplanis inter semina clausum, nec farctum.*

A. Heteracanthæ. *Spinæ minores (interdum raræ) plus minus recurvæ; auctæ sæpius numerosæ rectæ. Legumen maturum sæpe turgidum, v. subteres. Pedunculi axillares.*

* *Legumen rectum, v. curvulum, latiusculum.*

309. A. HEBECLADA, *DC.! Cat. Hort. Monsp.* 73; *Prod.* ii. 461. Piloso-hispidula. Spinæ minores subulato-conicæ recurvæ, auctæ paucæ v. pleræque rectæ. Pinnæ 3–7-jugæ; foliola 7–15-juga, oblongo-linearia, obtusa, $1\frac{1}{2}$–2 lin. longa. Involucellum in medio pedunculo v. inferius, caducum v. obsoletum. Legumen rectum v. obliquum, crassissimum, $2\frac{1}{2}$–6 poll. longum, 1 poll. latum, flavescens, oblique venosum, valvis turgidis crasso-coriaceis.—*Harv. et Sond. Fl. Cap.* ii. 280; *Oliv. Fl. Trop. Afr.* ii. 348.

A. stolonifera, Burch.! Trav. ii. 241.

Hab. Subtropical South-central Africa.

310. A. MAUROCEANA, *DC.! Cat. Hort. Monsp.* 74; *Prod.* ii. 461. Tenuiter cano-pubescens. Spinæ minores aculeiformes recurvæ, auctæ paucæ rectæ. Pinnæ 3–8-jugæ; foliola 10–20-juga, oblongo-linearia, ad 2 lin. longa. Involucellum infra medium pedunculi caducum. Legumen immaturum planum, pubescens, 3-pollicare, 5 lin. latum, valvis crasso-coriaceis.

Mimosa mauroceana, Desf. Cat. Hort. Par. 181 ex DC.

Hab. Extratropical North Africa: Morocco, *Desfontaines*.

Only known from garden specimens, of which I have not seen the ripe fruit.

311. A. EDGEWORTHII, *T. Anders.! Fl. Aden.* 18, *in Journ. Linn. Soc.* v. *Suppl.* Cano-puberula. Spinæ minores paucæ subrecurvæ, pleræque auctæ rectæ, validæ, $\frac{1}{2}$–1-pollicares, teretes. Pinnæ 3–6-jugæ; foliola 6–10-juga, oblonga, ad 2 lin. longa. Involucellum supra medium pedunculi v. 0 (caducum?). Legumen turgidum, v. subteres, curvum, cano-tomentosum, 3–4-pollicare, 4–5 lin. latum, obscure striato-venosum, tardius dehiscens.

A. erioloba, Edgew.! in Journ. Asiat. Soc. Beng. xvi. 1215, non E. Mey.

Hab. Arabia: Aden, *Edgeworth, T. Thomson, T. Anderson, and others.*

312. A. REFICIENS, *Wawra et Peyr. Sert. Beng.* 15. Canescens demum glabrata. Spinæ minores recurvæ, auctæ desunt. Pinnæ 3–4-jugæ; foliola 8–12-juga, oblonga, $2\frac{1}{2}$–3 lin. longa, glabra, glauca. Involucellum prope basin pedunculi. Legumen rectum v. curvulum, compressum, obsolete puberulum, 3–$3\frac{1}{2}$-pollicare, 6–8 lin. latum, obscure venosum, bivalve.—*Oliv. Fl. Trop. Afr.* ii. 348.

Hab. South-west tropical Africa, *Wawra, Welwitsch.* I have not seen the specimens.

** *Legumen angustius, sæpe tortile.*

313. A. PLANIFRONS, *Wight et Arn.! Fl. Penins. Ind. Or.* 276. Subglabra. Spinæ minores recurvæ, auctæ longæ rectæ albæ subulatæ v. inflatæ. Pinnæ 5–6-jugæ; foliola 10–12-juga, linearia, obtusa, 1–$1\frac{1}{2}$ lin. longa. Involucellum infra medium pedunculi tenuis persistens. Legumen turgidum v. subteres, contortum, glabrum, 4–6 lin. latum.

Hab. Tropical Asia: East-Indian peninsula.

Occurs in many old collections as *Mimosa eburnea.* See the note under *Acacia eburnea.*

314. A. LITAKUNENSIS, *Burch.! Trav.* ii. 452. Puberula. Spinæ minores uncinato-recurvæ, auctæ in speciminibus desunt. Pinnæ 4–6-jugæ; foliola 9–13-juga anguste oblonga, obtusa, 1–$1\frac{1}{2}$ lin. longa. Involucellum prope basin pedunculi caducum v. 0. Legumen tortile, ad 3 lin. latum, valvis convexis tenuiter venosis.—*Harv. et Sond. Fl. Cap.* ii. 283.

Hab. Subtropical South-central Africa, near Litakun, *Burchell*; also in Baines's collection.

315. A. HETERACANTHA, *Burch.! Trav.* i. 389. Molliter tomentoso-pubescens. Spinæ minores uncinato-recurvæ, auctæ rectæ, albæ, 1–2-pollicares. Pinnæ 5–10-jugæ; foliola 10–15-juga, oblongo-linearia, rigidula, 1–$1\frac{1}{2}$ lin. longa. Involucellum infra medium v. prope basin pedunculi caducum v. 0. "Legumen lineare."—*Harv. et Sond. Fl. Cap.* ii. 280.

Hab. Extratropical South Africa: Vaal river, *Burchell, Shaw.*

I have not seen the pod; there are none on Burchell's specimens.

316. A. SPIROCARPA, *Hochst.! A. Rich. Fl. Abyss.* i. 239. Pubescens. Spinæ minores recurvæ, auctæ rectæ 1–$2\frac{1}{2}$-pollicares. Pinnæ 4–10-jugæ; foliola 7–15-juga, oblongo-linearia, $\frac{1}{2}$–$1\frac{1}{2}$ lin. longa. Involucellum infra medium pedunculi minimum v. interdum deficiens. Legumen elongatum, contortum, tomentosum, demum turgidum, 3–4 lin. latum.—*Schweinf. in Linnæa*, xxxv. 322, t. 4-6; *Oliv. Fl. Trop. Afr.* ii. 352.

Hab. Tropical and subtropical North-east Africa: Abyssinia, Nubia, Sennaar and Cordofan.

A. gummifera, Delile Fl. Æg. Illustr. ex ejusd. Pl. Caill. 21, may be, according to Schweinfurth, the *A. spirocarpa.* Delile's name was taken from the *Mimosa gummifera*, Forsk., mentioned by name only in Fl. Æg. Arab. p. cxxiv, and certainly not the same as the *A. gummifera*, Willd.

A. Petersiana, Bolle in Pet. Mossamb. Bot. 4, which is unknown to me, is believed by Oliver to be very near to if not identical with *A. spirocarpa.* The fruit, however, is unknown.

Mimosa tortilis, Forsk. Fl. Æg. Arab. 176, must be either *A. spirocarpa* or *A. tortilis*; the character given is insufficient for determination.

317. A. TORTILIS, *Hayne, Arzneig.* x. t. 31. Glabra. Spinæ minores recurvæ, auctæ rectæ, 1–2-pollicares. Pinnæ 2–6-jugæ; foliola 8–12-juga, oblongo-linearia, obtusa, 2–3 lin. longa. Involucellum medium versus pedunculi. Legumen anguste lineare, falcatum v. contortum, planum, glabrum, valvis coriaceis.—*Nees, Pl. Offic.* t. 335; *Schweinf. in Linnæa,* XXXV. 327; *Oliv. Fl. Trop Afr.* ii. 352.

A. fasciculata, Guill. et Perr.! Fl. Seneg. 252, non H., B. et K.

A. Raddiana, Savi, Acac. Egiz. 1, fide Schweinf.

A. Perrottetii, Steud. Nom. Bot. ed. 2.

Hab. Tropical and subtropical North-east Africa, Senegambia, Nubia, and Egypt, also in Arabia.

B. Moniliformes. *Spinæ omnes rectæ v. minores rarius recurvæ. Pedunculi axillares. Legumen coriaceum v. subcarnosum, planum, inter semina regulariter plus minus constrictum v. sinuatum, articulis (haud solvendis) orbiculatis v. quadratis.*

318. ? A. WIGHTII, *Baker in Hook. Fl. Ind. ined.* Glabra. Spinæ minores conicæ, auctæ validæ, fuscæ, 2-pollicares longioresque. Pinnæ 1–3-jugæ; foliola 8–12-juga, oblonga, obtusa, 3–5 lin. longa, pennivenia. Involucellum infra medium pedunculi persistens. Legumen ignotum.

Hab. Tropical Asia. Indian Peninsula, sea-coast, Tinivelly, *Wight.*

The affinities of this species must remain uncertain till the fruit is known; but it appears to be nearly allied to *A. arabica,* differing chiefly in the size and venation of the leaflets.

319. A. ARABICA, *Willd. Spec.* iv. 1085. Glabra v. tomentoso-pubescens. Spinæ minores rectæ v. rarius recurvæ, auctæ demum eburneæ, pollicares longioresque. Pinnæ 4–8-jugæ, rarius 1–3-jugæ; foliola 10–30-juga, oblongo-linearia, obtusa, 2–3 lin. longa, uninervia. Involucellum in medio pedunculo persistens. Legumen glabrum v. cano-tomentosum, planum v. ad semina convexiusculum, inter semina sæpius constrictum, 4–7-pollicare, 4–8 lin. latum.—*Hayne Arzneig.* x. t. 32; Nees, Pl. Offic. t. 333; *Schweinf.! in Linnæa,* XXXV. 335; *Oliv. Fl. Trop. Afr.* ii. 350; *Bedd. Fl. Sylv.* t. 47.

Mimosa arabica, Lam. Dict. i. 19; Roxb.! Corom. Pl. t. 149.

M. nilotica, Linn. Spec. 1506.

Acacia nilotica, Desf. Cat. Hort. Par. ed. 2, 208; Nees, Pl. Offic. x. 332; Schweinf. in Linnæa, XXXV. 333.

A. vera, Willd. Spec. iv. 1085; Hayne, Arzneig. x. t. 34.

A. Adansonii, Guill. et Perr.! Fl. Seneg. 249.

Mimosa adstringens, Schum. et Thonn.! Beskr. Guin. Pl. 327.

Hab. Tropical Africa and Asia: generally distributed over the African region, and extending through Afghanistan to the Indian peninsula.

The specimens of this plant show so great a diversity in the indumentum, the spines, the number of pinnæ, and even in the fruit, that I should readily have adopted its proposed division into at least four species could I have ascertained any constancy or correlation in the different characters. What may be considered as the typical *A. arabica* is chiefly abundant in tropical Africa, has always the extremities pubescent or tomentose, the spines all straight, the legume white-tomentose, rather deeply indented between the seeds. *A. Adansonii,* from Senegambia, is rather less pubescent, more hoary, and the pod broad, only very slightly notched, but marked with transverse furrows between the seeds. *Mimosa adstringens,* according to the notes I took at Copenhagen in 1846, differs from *A. Adansonii,* in the short

spines being somewhat recurved. In a variety from Natal, which I had named *Kraussiana*, the short spines are still more recurved, the pod sometimes like that of *A. Adansonii*, but in other specimens more deeply indented, and sometimes nearly glabrous, or narrower. The Indian form is in most respects like the typical *A. arabica*, but more glabrous, the pod always hoary or white. The *A. nilotica* or *A. vera*, from Egypt and Nubia, is quite glabrous, the pod green and usually very deeply indented, the one-seeded orbicular articles resembling flat beads, connected by narrow isthmuses; but the indentations of the pod are as inconstant as in *A. macracantha*; and I have seen, in two or three other cases, one portion of the pod as little indented as in *A. Adansonii*, and another portion of the same pod as deeply so as in *A. nilotica*.

A. pseudo-arabica, Blume, of uncertain origin, is very imperfectly described by Miquel, Fl. Ind. Bat. i. part i. 8, from a very bad specimen, which he thinks may prove to be a variety of *A. arabica*, or of *A. Seyal*.

320. A. Kirkii, *Oliv.! Fl. Trop. Afr.* ii. 350. Subglabra. Spinæ minores rectæ uti folia et flores *A. arabicæ*. Legumen glabrum, 4–6 lin. latum, inter semina leviter constrictum et transverse depressum, articulis medio valde elevatis late conico-tuberculatis.

Hab. South-tropical Africa: Highlands of the Batoka country, *Kirk.*

The great tubercular thickening of the pod over each seed may not prove to be more constant than the other variations in the pod of *A. arabica*, to which in that case this plant would be referred as a variety.

C. Thyrsifloræ. *Spinæ omnes rectæ. Inflorescentia foliis floralibus minimis v. abortientibus ad apices ramorum racemosa. Legumen continuum, rectum v. curvum, valvis coriaceis planis v. convexiusculis.*

321. A. horrida, *Willd. Spec.* iv. 1082. Glabra. Spinæ minores conicæ v. subulatæ, auctæ eburneæ, 1–4-pollicares. Pinnæ 1–3-, rarius 4-jugæ; foliola 5–12-juga, oblongo-linearia, obtusa, 2–5 lin. longa. Involucellum in medio pedunculo persistens. Legumen 4–6-pollicare, 3–4 lin. latum, planum, incurvum, glabrum, continuum v. sinuatum. —*Harv.! et Sond. Fl. Cap.* ii. 281.

Mimosa horrida, Linn. Spec. 1505.

M. eburnea, Hort. Par.!; Boj.! Hort. Maurit. 115, et Hortul. plur. vet. non Linn. f.

M. leucacantha, Jacq. Hort. Schoenbr. iii. 75, t. 393.

M. nilotica, Thunb. Fl. Cap. 432, non Linn.

Acacia capensis, Burch. Trav. i. 195 (ic. 189); Colla in Mem. Acad. Torin. xxxv. 175.

A. Karroo, Hayne, Arzneigew. x. t. 33.

Hab. Extratropical South Africa: Cape colony; naturalized in Mauritius.

Burchell adopted the name of *A. capensis* for this species, supposing it to be the *Mimosa capensis*, Burm. Fl. Cap. Prod. 27, which it probably is. Burmann, however, gives the name only, referring to Plukenet's plate 123. f. 2, which is evidently made up of several different plants, as the phrases he quotes refer to very different species. Linnæus refers to the same plate for his *Mimosa reticulata*, Mant. 129, but adds to it the description of a plant from the Upsala garden, with a flat reticulate pod, "palmaris" in length, and "semipalmaris" in breadth, which is totally at variance with the narrow turgid pod figured by Plukenet. Willdenow, in characterizing his *Acacia reticulata*, Spec. iv. 1056, copies Linnæus's references and description, adding, however, the *v. s.*, but without reconciling the discrepancies. The Linnean herbarium does not contain the *M. reticulata*; and in Willdenow's the *A. reticulata* is represented by a specimen which, according to Walpers, in Linnæa, xiii. 542, is identical with his *A. Giraffæ*. It becomes, therefore, necessary to reject both the *A. reticulata* and *A. capensis*, as being made up of different species, but with the *A. horrida* as their principal basis.

322. A. NATALITIA, *E. Mey.! Comm. Pl. Afr. Austr.* 167. Glabra. Spinæ minores conicæ, auctæ raræ, rectæ, 1–2-pollicares. Pinnæ 4–7-jugæ, rarius 2–3-jugæ; foliola 12–30-juga, oblongo-linearia, obtusa, 2–3 lin. longa. Involucellum in medio pedunculo persistens. Legumen lineare, curvum, complanatum, glabrum, sub-4-pollicare, 2–3 lin. latum, valvis obscure venosis.—*Harv. et Sond. Fl. Cap.* ii. 281.

Hab. Extratropical South-west Africa, Natal district.

323. A. GERRARDI, *Benth., sp. nov.* Tomentoso-pubescens. Spinæ minores brevissime conicæ, auctæ ignotæ. Pinnæ 6–10-jugæ; foliola 15–25-juga, linearia, 2–3 lin. longa, supra nitida, subtus pallida. Involucellum infra medium v. prope basin pedunculi. Legumen arcuatum v. circinatum, cano-tomentosum, ad 4 lin. latum, valvis planis crasse coriaceis subaveniis.

Hab. Extratropical South-east Africa; Natal district, *W. F. Gerrard, n.* 1702.

Habitus fere *A. arabicæ,* inflorescentia *A. horridæ* accedens. Stipulæ crassæ, conicæ, subconnatæ, tomentosæ, pungentes, in speciminibus vix 2 lineas excedentes. Foliorum petiolus communis 2–3-pollicaris, pinnæ 1–1½ poll. longæ. Pedunculi ad nodos fasciculati, pollicares, in racemum terminalem aphyllum dispositi. Capitula multiflora. Calyx ciliatus. Petala duplo saltem longiora, glabra. Semina longitudinalia, oblonga, plana, funiculo longiusculo apice non incrassato.

324. A. AMYTHETHOPHYLLA, *Steud.! A. Rich. Fl. Abyss.* i. 245. Puberula v. glabrescens. Spinæ minores minimæ, auctæ desunt et sæpe omnes obsoletæ. Pinnæ 12–20-jugæ; foliola 30–50-juga, oblongo-linearia, 2–2½ lin. longa, glabra. Involucellum in medio pedunculo persistens. Legumen lineari-oblongum, planum, 4–6-pollicare, 7–8 lin. latum, valvis coriaceis nitidis obscure venosis.—*Schweinf. in Linnæa,* xxxv. 360; *Oliv. Fl. Trop. Afr.* ii. 346.

Hab. North-west tropical Africa: Abyssinia, *Schimper.*

D. Pubifloræ. *Spinæ omnes rectæ. Pedunculi axillares. Flores tomentoso-pubescentes. Legumen coriaceum, continuum, curvum.*

325. A. TOMENTOSA, *Willd. Spec.* iv. 1087. Velutino-tomentosa. Spinæ minores conicæ, tomentosæ, auctæ validæ, 1–2-pollicares, sæpius fuscæ. Pinnæ 10–12-jugæ; foliola 20–30-juga, anguste linearia, 2–3 lin. longa. Involucellum nunc in medio pedunculo, nunc multo altius, rarius inferius, persistens. Legumen complanatum, curvum, cano-puberulum v. glabratum, 4–6-pollicare, 4–5 lin. latum, valvis tenuiter coriaceis demum ad semina convexis obscure venosis.

Mimosa Kleinii, Poir. Dict. Suppl. i. 82.

M. tomentosa, Rottl.! in Ges. Nat. Fr. Berlin, N. Schr. iv. 208.

Acacia chrysocoma, Miq.! Fl. Ind. Bat. i. pars i. 6.

Hab. Tropical Asia: Bengal, Java, Ceylon, and perhaps the Peninsula.

I can find no difference between the Javan specimens published by Miquel as *A. chrysocoma* and the typical Bengalese *A. tomentosa,* which Miquel introduces into his Supplement on the authority of others, without any attempt to compare the two plants. The Ceylon specimens gathered by Gardner in the north of the island are more rigid, with rather larger leaflets. I have seen no Peninsular specimens except what are probably from a garden.

326. A. LASIOPETALA, *Oliv.! Fl. Trop. Afr.* ii. 346. Cano- v. subflavescenti-tomentoso-pubescens. Spinæ minores conicæ, auctæ semipollicares, validæ, tomentosæ. Pinnæ

14–22-jugæ. Foliola 20–30-juga (v. plura?). Involucellum infra medium pedunculi parvum, caducum, v. 0. Legumen ignotum.

Hab. Tropical South-west Africa: Shiré river, *Kirk*; also in *Baines's* collection.

There are fragments of what appears to be another species of *Acacia* with globular silky-pubescent flower-heads from the same region, but insufficient for description.

E. Normales. *Spinæ omnes rectæ. Flores glabri v. parce puberuli. Legumen rectum v. arcuatum, valvis membranaceis v. tenuiter coriaceis* (*excepta* A. Bidwilli) *planis v. demum convexis sæpissime oblique reticulato-venosis.*

* *Australienses.*

327. A. SUBEROSA, *A. Cunn.! Benth. in Hook. Lond. Journ.* i. 499. Hirtella. Spinæ tenues. Pinnæ 1–2-jugæ; foliola 8–12-juga, oblongo-linearia, rigidula, 1–2 lin. longa. Legumen complanatum, crassiusculum, pubescens, ad 3 poll. longum, 3–6 lin. latum, valvis convexis coriaceis. Semina pubescenti-lanata.—*Fl. Austral.* ii. 420.

Hab. Tropical North-west Australia.

This species is as yet but very imperfectly known.

328. A. BIDWILLI, *Benth.! in Linnæa*, xxvi. 629. Glabra. Spinæ minores minutæ v. obsoletæ, auctæ vix 3 lin. longæ. Pinnæ 15–20-jugæ; foliola 15–25-juga, oblonga, obtusa, rigida, vix lineam longa. Involucellum in medio pedunculo deciduum. Legumen rectum, glabrum, 3–6-pollicare, ad 6 lin. latum, valvis convexis coriaceis. Semina glabra. —*Fl. Austral.* ii. 420.

Hab. Tropical North and North-east Australia.

329. A. PALLIDA, *F. Muell.! in Journ. Linn. Soc.* iii. 147, *pro parte*. Glabra, pallida v. subglauca. Spinæ crassiusculæ, breves v. obsoletæ. Pinnæ 3–10-jugæ; foliola 10–20-juga, oblonga, coriacea, 3–4 lin. longa. Involucellum in medio pedunculo deciduum. Legumen ignotum.—*Benth.! Fl. Austral.* ii. 421.

Hab. Tropical North Australia.

** *Africanæ platycarpæ.*

330. ? A. GUMMIFERA, *Willd. Spec.* iv. 1056. Glabra. Spinæ auctæ teretes, ½–¾-pollicares. Pinnæ 1- rarius 2-jugæ; foliola 3–10-juga, oblonga, obtusa, 1–2 lin. longa. Flores ignoti. (Spicæ ovales v. oblongæ dicuntur.) Legumen curvum, subplanum, tomentosum, 4-pollicare, ad 6 lin. latum.—*Hayne, Arzneigew.* x. t. 28.

Mimosa gummifera, Brouss. in Poir. Dict. Suppl. i. 164.

Hab. Extratropical North Africa: Morocco.

I only know this from Hayne's figure, taken from a specimen in leaf only, and a loose pod in Willdenow's herbarium, and from specimens gathered in South Morocco by Dr. Hooker and by Messrs. Reinand Fritzsch, all in leaf only. It remains, therefore, very uncertain whether the species should be placed in the present group, of which it has the aspect, or amongst the spicate *Gummiferæ*.

A. coronillæfolia, Desf. Cat. Hort. Par. ed. 3, 207, raised from Morocco seeds, and only known in leaf. is probably a luxuriant form of the same plant. *A. cassioides*, Willd. Enum. Hort. Berol. 1051, another garden plant only known in leaf, may be referrible to *A. gummifera*, or perhaps to *A. horrida*. The specimens I have seen have, like the former, but one pair of pinnæ, but longer leaflets.

331. A. ROBUSTA, *Burch.! Trav.* ii. 442. Glabra. Spinæ minores validæ, conicæ, auctæ eburneæ, 2–3-pollicares. Pinnæ 2–4-jugæ; foliola 8–15-juga, oblongo-linearia, obtusa, 3–4 lin. longa. Involucellum infra medium pedunculi persistens. Legumen stipitatum, planum, rectum v. curvulum, glabrum, 2–3-pollicare, 6–9 lin. latum, valvis coriaceis.—*Oliv.! Fl. Trop. Afr.* ii. 349; *Harv. et Sond. Fl. Cap.* ii. 281.

Hab. Tropical and subtropical South Africa, *Burchell, Welwitsch.*

332. A. CLAVIGERA, *E. Mey.! Comm. Pl. Afr. Austr.* 168, Glabra. Spinæ minores brevissimæ, conicæ; auctæ desunt. Pinnæ 2–4-jugæ. Foliola 20–30-juga, oblongo-linearia, obtusa, coriacea, 3–5 lin. longa. Flores ignoti. Pedunculi fructiferi breves. Legumen subsessile, lanceolatum, curvum, crassum, complanatum, glabrum, sub-4-pollicare, ad 6 lin. latum, valvis convexiusculis rigide coriaceis obscure venosis.

Hab. Extratropical South-east Australia: Natal district, *Drège.*

I had formerly thought that these were fruiting specimens of *A. natalitia*; but some since received, with the narrow pods of *A. horrida*, are a better match to the typical flowering ones of *A. natalitia*.

333. A. VERUGERA, *Schweinf.! in Linnæa*, XXXV. 340, t. 9, 10. Glabra, pallida. Spinæ minores minimæ v. obsoletæ, auctæ tenues, teretes, 2–4-pollicares. Pinnæ 7–8-jugæ; foliola 20–30-juga, lineari-oblonga, obtusa, rigidula, 1–2 lin. longa. Involucellum ad medium pedicelli v. altius, minimum. Legumen stipitatum, rectum, vix venosum, 3–6-pollicare, $\frac{3}{4}$–1 poll. latum, valvis coriaceis crassiusculis.—*Oliv.! Fl. Trop. Afr.* ii. 354.

Hab. Tropical North-east Africa.

The fruit is described from Abyssinian specimens, which appear to belong to the same species as the Nubian flowering ones.

334. A. ABYSSINICA, *Hochst.! Benth. in Hook. Lond. Journ.* v. 97. Molliter pubescens v. glabrata. Spinæ (omnes ?) breves v. ad stipulas innocuas v. minutas reductæ. Pinnæ 6–30-jugæ; foliola 20–40-juga, linearia, obtusa, $1\frac{1}{2}$–2 lin. longa, v. in ramis sterilibus majora. Involucellum infra medium v. prope basin pedunculi persistens. Legumen rectum v. subfalcatum, glabrum, longitudinaliter reticulato-venosum, 3–5-pollicare, 8–9 lin. latum, valvis coriaceis convexiusculis.—*Oliv.! Fl. Trop. Afr.* ii. 347; *Schweinf. in Linnæa*, XXXV. 320.

A. xiphocarpa, Hochst.! Benth. in Hook. Lond. Journ. v. 96.
Inga Nefasia, Hochst.! in A. Rich. Fl. Abyss. i. 237.
Albizzia Nefasia, Walp. Ann. ii. 457.

Hab. Tropical North-east Africa.

335. A. TRISTIS, *Welw.*; *Oliv. in Fl. Trop. Afr.* ii. 349. Cinereo-pubescens. Spinæ minores conicæ, auctæ elongatæ, teretes. Pinnæ 6–11-jugæ. Foliola 10–18-juga, linearia, acutiuscula, 2–$2\frac{1}{2}$ lin. longa. Involucellum infra medium v. prope basin pedunculi. Legumen rectum v. leviter curvum, complanatum, basi contractum, tomentoso-pubescens, 4–6-pollicare, vix semipollicem latum, obscure venosum, in speciminibus vix maturum.

Hab. Tropical South-west Africa: Angola, *Welwitsch.* I have not myself seen the specimens.

336. A. ETBAICA, *Schweinf.! in Linnæa*, XXXV. 330, t. 7, 8. Glabra. Spinæ minores rectæ interdum obsoletæ, auctæ desunt. Pinnæ 3–6-jugæ; foliola 14–30-juga, oblonga,

obtusa, crassiuscula, 1–1½ lin. longa. Involucellum in medio pedunculo persistens. Legumen rectum v. leviter curvum, complanatum, glabrum, 1½–3½-pollicare, 3–4 lin. latum, valvis coriaceis venosis.—*Oliv.! Fl. Trop. Afr.* ii. 349.

A. xiphocarpa, Hochst.! in Schimp. Pl. Abyss. n. 1057 nec n. 522.

Hab. Tropical North-east Africa: Nubia and Abyssinia.

Oliver unites with this species a Benguela plant of Welwitsch's with the short spines recurved. We have not now the specimens before us for further comparison.

336*. A. XANTHOPHLŒA, *Benth.*, sp. nov. Glabra v. pilosula. Spinæ minores conicæ, auctæ validæ, teretes, 2–3-pollicares. Pinnæ 6–10-jugæ; foliola 15–20-juga, linearia, ad 2 lin. longa. Involucellum infra medium pedunculi e bracteis 1–2 majusculis. Legumen tenuiter stipitatum, planum, 2–3-pollicare, 4–6 lin. latum, marginibus carinatis, valvis tenuibus subtransverse reticulatis.

Hab. Tropical South-east Africa: Senna on the Zambesi, *Kirk*; Zomba at the east end of Lake Shirwa, *Mello*; the former specimens in fruit, the latter in flower, but apparently belonging to the same species.

"Arbor procera, gummifera, cortice flavo, ligno molli." Folia pilis paucis conspersa. Glandula scutellata inter pinnas paris ultimi et interdum prope basin petioli, sæpeque parvæ inter foliola parium paucorum. Pedunculi axillares, 1–1½-pollicares. Involucelli bractea sæpius obliqua, linea paullo longior. Flores in capitulo glabriusculi. Legumen stipite venatione et carina prominula ab omnibus affinibus diversum."

337. A. NUBICA, *Benth.! in Hook. Lond. Journ.* i. 498. Glabra v. junior pubescens. Spinæ minores parvæ, conicæ, sæpius tomentosæ; auctæ rectæ, subsemipollicares, rarius subrecurvæ brevioresque. Pinnæ 3–12-jugæ; foliola 6–15-juga, oblonga, obtusa, subglauca, 2–3 lin. longa. Involucellum infra medium pedunculi persistens. Legumen subsessile, rectum v. vix curvum, 2–3-pollicare, ad 6 lin. latum, marginibus acute carinatis v. anguste alatis, valvis coriaceis convexiusculis.—*Schweinf. in Linnæa,* xxxv. 337; *Oliv.! Fl. Trop. Afr.* ii. 348.

A. Aucheri, Benth.! in Hook. Lond. Journ. i. 499.

A. pterygocarpa, Hochst.!; Benth. in Hook. Lond. Journ. v. 96.

Hab. Tropical North-east Africa and probably Arabia, province Mascate, *Aucher.*

Mimosa Örfota, Forsk. Fl. Æg. Arab. 177, from Dakhi, must be very near *A. nubica.* The stipular spines are described as being as long as the leaves, whilst in *A. nubica* they are usually very short. The short character in other respects agrees with *A. nubica.*

**** Indicæ, altera platycarpa, altera stenocarpa.*

338. A. JACQUEMONTI, *Benth.! in Hook. Lond. Journ.* i. 499. Glaberrima. Spinæ minores paucæ, auctæ eburneæ teretes, 1–3-pollicares. Pinnæ 2–4-jugæ; foliola 5–10-juga, oblongo-linearia, obtusa, 1–1½ lin. longa. Involucellum in medio pedunculo caducum. Legumen longe stipitatum, rectum, glaucum, 2–3-pollicare, ad 6 lin. latum, valvis planis tenuissime venosis.

Hab. Tropical Asia: plains of Upper India and Punjab.

339. A. EBURNEA, *Willd. Spec.* iv. 1081. Villosula v. glabrata. Spinæ minores tenues, rectæ; auctæ eburneæ, sæpe incrassatæ, 1–2-pollicares. Pinnæ 2–4- rarius 6–8-jugæ; foliola 6–10-juga, conferta, obtusa, ½–1 lin. longa. Involucellum in medio

pedunculo caducum. Legumen stipitatum, planum, curvum, glabrum v. glaucum, 2–5-pollicare, 2–3 lin. latum, valvis tenuibus vix venosis.

Mimosa eburnea, Linn. f. Suppl. 437; Roxb. Corom. Pl. ii. 54, t. 199 (excl. leg.?).

Hab. Tropical Asia: East-Indian peninsula and Upper India. Perhaps also Aden in Arabia; but the specimens from thence are not in fruit and are therefore doubtful.

A. Roxburghii, Wight and Arn. Fl. Penins. Ind. Or. 276, was founded on Roxburgh's *M. eburnea*, who figures the pod (detached) as twisted like that of *A. planifrons*, but flat (not turgid) like that of *A. eburnea*. It would appear that Roxburgh had confounded the two species. The specimen of Roxburgh's in the Banksian herbarium mentioned by Arnott cannot now be found there; and I have not seen the *A. Campbellii*, Arn. in Nov. Act. Nat. Cur. xviii. 333, which, according to T. Thomson, is the same species. The flowering branch figured by Roxburgh appears to me without doubt to represent the true *A. eburnea* in a very young flowering state.

**** *Africanæ stenocarpæ.*

340. A. Seyal, *Delile. Fl. Eg.* 142, t. 52. f. 2. Glabra v. puberula. Spinæ minores breviter conicæ, auctæ demum eburneæ, tenues, 1–3-pollicares, basi interdum insectorum ictu inflatæ. Pinnæ 3–9-jugæ; foliola 8–20-juga, lineari-oblonga, $1\frac{1}{2}$–$2\frac{1}{2}$ lin. longa. Involucellum infra medium pedunculi caducum. Legumen curvulum v. subtortum, planum, glabrum, 3–6-pollicare, 2–3 lin. latum, valvis coriaceis longitudinaliter venosis.—*Schweinf.! in Linnæa*, xxxv. 348; *Nees, Pl. Offic.* t. 336; *Oliv.! Fl. Trop. Afr.* ii. 351; *Hayne, Arzneik.* x. t. 30.

A. Giraffæ, Sieb.! Herb. Seneg. n. 45 non Willd.

Hab. Tropical Africa, ranging over the greater part of the region, extending perhaps to Arabia and southern Palestine, but the specimens uncertain for want of the fruit.

Var. *fistula*, cortice albo, foliolis 3–4 lin. longis.—*Oliv.! l. c.*

A. fistula, Schweinf.! in Linnæa, xxxv. 344, t. 11–14.

Hab. Tropical North-east Africa.

341. A. Ehrenbergiana, *Hayne, Arzneik. Gew.* x. t. 29. Glabra v. puberula. Spinæ tenues, auctæ ultrapollicares. Pinnæ 1- rarius 2-jugæ. Foliola 8–10-juga, oblonga, obtusa, 1–$1\frac{1}{2}$ lin. longa. Involucellum infra medium pedunculi caducum. Legumen lineare, falcatum, usque ad $4\frac{1}{2}$ poll. longum, 2–3 lin. latum, inter semina sinibus latis contractum.—*Schweinf.! in Linnæa*, xxxv. 352, t. 15, 16; *Oliv.! Fl. Trop. Afr.* ii. 352.

A. Ehrenbergii, Nees, Pl. Offic. t. 334.

Hab. Tropical North-east Africa: Nubia and Abyssinia.

342. A. stenocarpa, *Hochst.! A. Rich. Fl. Abyss.* i. 238. Glabra v. minute puberula. Spinæ minores rectæ, brevissimæ v. obsoletæ; auctæ paucæ, validæ, semipollicares. Pinnæ 4–10-jugæ; foliola 10–20-juga, linearia, acutiuscula, 1–$2\frac{1}{2}$ lin. longa. Involucellum medium versus v. prope basin pedunculi caducum. Legumen lineare, planum, curvum, 2–4-pollicare, ad 2 lin. latum, inter semina non contractum, valvis tenuiter longitudinaliter venosis.—*Schweinf. in Linnæa*, xxxv. 355, t. 17, 18; *Oliv.! Fl. Trop. Afr.* ii. 351.

A. Giraffæ, Hochst.! in Pl. Schimp. Abyss.

Hab. Tropical North-east Africa: Nubia and Abyssinia.

343. A. HIRTELLA, *E. Mey.! Comm. Pl. Afr. Austr.* 167. Hirtella. Spinæ tenues, minores brevissimæ v. obsoletæ, auctæ subsemipollicares. Pinnæ 6–8-jugæ. Foliola 10–15-juga, oblongo-linearia, 1–1½ lin. longa. Involucellum in medio pedunculo caducum. Legumen stipitatum, lineare, planum, subfalcatum, 2–3-pollicare, ad 3 lin. latum, inter semina late contractum, glabrum.—*Harv. et Sond. Fl. Cap.* ii. 281.

Hab. Extratropical South-east Africa: Natal district.

**** *Boreali-Americanæ, stenocarpæ.*

344. A. CONSTRICTA, *Benth.! in A. Gray, Pl. Wright.* i. 66. Subglabra. Spinæ minores tenues, rectæ v. subrecurvæ, auctæ rectæ, validæ, subsemipollicares. Pinnæ 2–6-jugæ; foliola 6–10-juga, oblonga, obtusa, vix lineam longa. Involucellum in medio pedunculo parvum. Legumen stipitatum, lineare, planum, 2–5-pollicare, 1½–2 lin. latum, inter semina distantia contractum, valvis tenuiter venosis.

Hab. Extratropical North America: Mexicano-Texan region.

345. A. SCHOTTII, *Torr.! Bot. Emory Exped.* 62. Canescens v. pallida. Spinæ minimæ v. 2–3 lin. longæ, rectæ. Pinnæ 1-jugæ; foliola 3–5-juga, alterna, lineari-teretia, ad 2 lin. longa, quam rhaches non latiora. Involucellum in medio pedunculo caducum. Legumen stipitatum, lineare, curvulum, 2–4-pollicare, ad 3 lin. latum, inter semina distantia contractum.

Hab. Extratropical North America: Mexican-Texan boundary.

F. Paniculatæ. *Spinæ omnes rectæ. Capitula breviter pedunculata, secus ramos paniculæ amplæ terminalis aphyllæ numerosa.*

346. A. LEUCOPHLŒA, *Willd. Spec.* iv. 1083. Tomentella v. demum glabrescens. Spinæ minores conicæ brevissimæ v. 0, auctæ (raræ) fuscæ, 1–2-pollicares. Pinnæ 5–12-jugæ; foliola 12–30-juga, oblongo-linearia, 2–4 lin. longa, rigidula. Involucellum in medio pedunculo caducum. Legumen lineare, curvum, complanatum, tomentosum, 4–6-pollicare, 3–4 lin. latum, valvis coriaceis marginibus elevatis.—*Brand. For. Fl.* t. 27; *Bedd. Fl. Sylv.* t. 48.

Mimosa leucophlœa, Roxb. Corom. Pl. ii. 27. t. 150.
Mimosa alba, Roxb. ex Rottl. in Ges. Nat. Fr. Berl. Neue Schr. iv. (1803) 208.
Acacia alba, Willd. Enum. Hort. Berol. Suppl. 68 (nomen tantum).
A. densa, Wall.! Cat. Herb. Ind. n. 5262.
A. microcephala, Grah.! in Wall. Cat. Herb. Ind. n. 5263.
A. explanata, Jungh. Reise, 260, ex Miq. Fl. Ind. Bat. i. pars i. 9.
A. melanochætes, Zoll. in Nat. en Geneesk. Arch. iii. 72 ex Miq. l. c.

Hab. Tropical Asia; from the Peninsula and Punjab to Burmah and the Archipelago.

Rottler, l. c. gives his *A. ferruginea* as a synonym of *M. alba,* Roxb.; but the species described as *A. ferruginea,* Rottl., by Sprengel, must be quite different, and is probably correctly referred by Arnott to the *A. pennata.*

347. A. ARCUATA, *Dcne.! Herb. Tim. Descr.* 133. Præcedenti simillima et vix nisi varietas stipulis sæpius obsoletis et legumine glabro.

Hab. Timor Island.

Subseries 3. Basibracteatæ. *Pedunculi ima basi bracteis parvis stipati, cæterum ebracteati. Spicæ cylindraceæ v. elongatæ, rarius globosæ. Legumen bivalve.*

* *Pycnanthæ Americanæ; flores in capitulo globoso v. spica oblonga densissime imbricati regulariter spirales.*

348. A. SPHÆROCEPHALA, *Cham. et Schl.! in Linnæa*, v. 594. Glabra. Spinæ minores tenues, 1–2 lin. longæ; auctæ 1–1½-pollicares, inflatæ, albæ, basi connatæ et ad 3 lin. latæ. Pinnæ 6–8-rarius multi-jugæ; foliola 10–20-juga, linearia, 2–4 lin. longa. Capitula globosa. Legumen ignotum.

Mimosa cornigera, Linn. Spec. 1505, pro parte.
Acacia cornigera, Willd. Spec. iv. 1080, pro parte.
Mimosa campechiana, Mill. Dict. n. 21, ex char.

Hab. Tropical America: Mexico and Central America; also Porto Bello, *Billberg*. The *A. cornigera* of botanical gardens has been most frequently this species.

349. A. SPADICIGERA, *Cham. et Schl.! in Linnæa*, v. 594. Glabra. Spinæ minores tenues; auctæ 1½-pollicares, inflatæ, lividæ, basi connatæ, ½ poll. latæ. Pinnæ 2–4-rarius 6–8-jugæ; foliola 15–20-juga, linearia, 3–5 lin. longa. Spicæ cylindraceæ, densissime imbricatæ, 6–9 lin. longæ. Legumen sessile, obliquum v. falcatum, crassum, glabrum v. vix tomentellum, 1½-pollicare, ad 4 lin. latum.

Mimosa cornigera, Linn. Spec. 1505, pro parte.
Acacia cornigera, Willd. Spec. iv. 1080, pro parte.

Hab. Tropical America: Mexico, near Vera Cruz, Central America, *Œrsted*; Panama, *Cuming*, n. 1270; Santa Marta, *Purdie*.

Specimens from Cuba, *R. de la Sagra* (*R. cornigera*, A. Rich.! Fl. Cub. i. 462), *Wright*, n. 2402, have the horn-like spines much longer, the spikes thicker and rather longer, but with innumerable small flowers very closely packed, as in the typical form, in numerous spiral rows; and they apparently belong to the same species.

** *Americanæ laxifloræ. Spicæ cylindraceæ v. elongatæ floribus distinctis v. subdissitis.*

350. A. AMENTACEA, *DC. Prod.* ii. 455, *ex ic. Mexicana*. Glabra. Spinæ tenues, auctæ ½–2½-pollicares. Pinnæ 1-jugæ: foliola 2–6-juga, obovali-oblonga, 3–6 lin. longa, venosa. Spicæ pollicares, floribus confertis nec imbricatis. Legumen ignotum.

A. rigidula, Benth! in Hook. Lond. Journ. i. 504.

Hab. Subtropical North America: Mexicano-Texan region.

351. A. FLEXICAULIS, *Benth.! in Hook. Lond. Journ.* i. 505. Glabra v. junior puberula. Spinæ tenues, auctæ subsemipollicares. Pinnæ sæpius 2-jugæ; foliola paris ultimi 4–6-juga, paris inferioris 2–3-juga, obovato-oblonga, membranacea, 3–4 lin. longa. Spicæ subpollicares. Legumen sessile, arcuatum, crassum, 4-pollicare, pollicem latum, valvis crasso-coriaceis.

Hooperia arborea, Buckl. in Proc. Acad. Philad. 1861, 453.

Hab. Extratropical North America, Mexicano-Texan region.

A. geniculata, Wendl., of German gardens, referred by Seemann, Eingef. Ac. 66, to *Calliandra scutellifera*, appears to me to correspond precisely with *A. flexicaulis*. The flowers and fruits of the garden-plant are unknown.

352. A. HINDSII, *Benth.! in Hook. Lond. Journ.* i. 504. Glabra. Spinæ minores subulatæ; auctæ maximæ, inflatæ, lividæ, 1–1½-pollicares, basi connatæ et ¾ poll. latæ. Pinnæ 6–15-jugæ; foliola 12–20-juga, linearia, obtusa, 2–3 lin. longa. Spicæ tenues, ¾–1½-pollicares. Legumen ignotum.

Hab. Tropical America, Mexico, *Hinds, Jurgensen*, n. 109.

When the spines are inflated, this species resembles *A. spadicigera*; but the pinnæ and leaflets are more numerous, the spines with the connate base very much broader, and the spikes of flowers very different.

(See also 388. *A. acatlensis*, in which the small fine stipules are almost spinescent.)

**** Gerontogeæ. Spicæ elongatæ v. breves, laxifloræ v. densiusculæ, floribus tamen non imbricatis.*

353. A. ALBIDA, *Delile, Fl. Eg.* 142, t. 52. f. 3. Glabra v. pilosula. Rami albidi. Spinæ minores subconicæ v. 0; auctæ validæ, basi lata incrassatæ, albæ, rarius semi-pollicem excedentes. Pinnæ 3–7-jugæ; foliola 7–15-juga, oblonga, obtusa, 3–4 lin. longa. Spicæ 2–5-pollicares, laxifloræ. Legumen valde arcuatum v. circinatum, ¾–1 poll. latum, basi stipiti sublaterali affixum, valvis crassis coriacco-subspongiosis.—*Oliv. Fl. Trop. Afr.* ii. 339.

A. selenicarpa, Desv.! in Hamilt. Prod. Fl. Ind. Occid. 60, patria falsa.

A. gyrocarpa, Hochst.! in Schimp. Pl. Abyss. Exs.

A. saccharata, Benth. in Hook. Lond. Journ. i. 505.

A. mossambicensis, Bolle in Peters, Mossamb. Bot. 5.

Prosopis? Kirkii, Oliv.! Fl. Trop. Afr. ii. 332.

Hab. Tropical Africa; generally spread over the region.

354. A. LATRONUM, *Willd. Spec.* iv. 1077. Glabra. Spinæ semiauctæ tenues, ½–1-pollicares, auctæ 2-pollicares longioresque, basi 3–4 lin. crassæ. Pinnæ 2–5-jugæ; foliola 6–15-juga, linearia v. oblonga, nunc omnia vix linea longiora, nunc 2–3-linearia. Spicæ 1–1½-pollicares, demum laxifloræ. Legumen planum, falcatum v. arcuatum, utrinque obtusum, glabrum, 1½–2-pollicare, 6–9 lin. latum, basi stipiti sublaterali affixum, valvis tenuibus coriaceis.—*Wight, Ic.* t. 1157.

Mimosa cornigera, Linn. Spec. 1505, quoad syn. Sebæ; Linn. f. Suppl. 438.

M. latronum, Linn. f. Suppl. 438.

Acacia umbraculata, Wight! in Wall. Cat. Herb. Ind. 4245.

A. dumosa, W. et Arn! Prod. Fl. Penins. 274, excl. syn. Roxb.

Hab. Tropical Asia: East-Indian peninsula.

355. A. LAHAI, *Steud. et Hochst.! Benth. in Hook. Lond. Journ.* i. 506. Glabriuscula. Spinæ tenues; auctæ 1–2-pollicares, albæ. Pinnæ 6–10-jugæ; foliola 12–20-juga, linearia, obtusa, 2 rarius 3 lin. longa. Spicæ 2–4-pollicares, longifloræ. Legumen rectum, ovale, planum, glabrum, 1½–2-pollicare, ad pollicem latum, stipite subcentrali, valvis tenuibus nitidis reticulatis. *Schweinf. in Linnæa*, xxxv. 359; *Oliv.! Fl. Trop. Afr.* ii. 340.

A. fasciculata, R. Br.! in Salt, Abyss. App. 65, nomen tantum

A. Saltiana, Steud. Nom. Bot. ed. 2.

Hab. Tropical North-east Africa.

Series 5. Vulgares.

Arbores v. frutices, interdum scandentes. Stipulæ non spinescentes. Aculei sparsi infrastipulares v. rarius 0. Folia bipinnata. Pedunculi axillares v. ad apices ramorum paniculati, monostachyi. Spicæ elongatæ cylindraceæ v. oblongæ, v. capitula globosa.

Subseries 1. *Gerontogeæ Spicifloræ*.

A. Triacanthæ. *Aculei terni, infrastipulares cum infrafoliaceo. Legumen valvis membranaceis tardius dehiscens, glabrum transversim reticulato-venosum, marginibus nerviformibus v. subcarinatis.*

356. A. hamulosa, *Benth. in Hook. Lond. Journ.* i. 509. Glabra, pallida. Aculei infrastipulares recti v. incurvi, tertio infrafoliaceo recurvo, in petiolo minimi sæpius adsunt. Pinnæ 2–3-jugæ; foliola 3–8-juga, oblique oblonga, obtusissima, 2–3 lin. longa. Spicæ 1–2-pollicares. Legumen 2–3-pollicare, $1\frac{1}{4}$–$1\frac{1}{2}$ poll. latum.

Hab. Arabia: Aden, *Hooker* and others; Djedda, *S. Fischer*, n. 72.

Mimosa Asak, Forsk. Fl. Æg. Arab. 176, Vahl, Symb. ii. 104, or *Acacia Asak*, Willd. Sp. iv. 1077, from Arabia, of which the flowers and fruits are unknown, is probably the *A. hamulosa*. Forskåhl describes the prickles as recurved, Vahl as straight or nearly so—a discrepancy which may be explained by the lateral straight one or the central recurved one being most prominent in the specimen described.

357. A. Senegal, *Willd. Spec.* iv. 1077. Glabra, pallida. Aculei infrastipulares recti v. incurvi, tertio infrafoliaceo recurvo, petiolo rarius armato. Pinnæ 3–5-jugæ. Foliola 10–15 juga, linearia, obtusa, rigidula, ad 2 lin. longa. Spicæ 2–3-pollicares. Legumen stipitatum, 3–4-pollicare, $\frac{3}{4}$ poll. latum.

Mimosa Senegal, Linn. Spec. 1506, excl. syn. fere omnibus.

M. senegalensis, Lam. Dict. i. 19.

Acacia Verek, Guill. et Perr.! Fl. Seneg. i. 245, t. 56; Schweinf. in Linnæa, xxxv. 374, t. 22, fr.; Rel. Kotsch. t. 3; Oliv. Fl. Trop. Afr. ii. 342.

A. rupestris, Stocks! Boiss. Fl. Orient. ii. 638.

Hab. Tropical Africa, Senegambia, and Upper Nubia: also in Scinde, *Stocks*.

It appears to me evident that Linnæus, in characterizing his *M. Senegal*, had in view the plant brought by Adanson from Senegal, as furnishing the best gum arabic of commerce, and which also constituted the *M. senegalensis* of Lamarck. Linnæus's reference to Adanson and to the three spines, with the central one recurved, identify the species, notwithstanding the confusion thrown on it by the various synonyms applying to almost as many different plants, and his note that it was easily known by its white bark, which has induced the false reference to *A. albida*.

I have in vain endeavoured to find any character to separate Stocks's plant, which agrees perfectly in foliage, flower, and fruit, notwithstanding the disseverance of the stations. The intermediate Arabia is, however, too little known to affirm that the area of the species may not be more continuous.

358. A. glaucophylla, *Steud.! A. Rich. Fl. Abyss.* i. 243. Glabra v. minute puberula, pallida. Aculei dum adsint infrastipulares subrecti, tertio infrafoliaceo recurvo, ramis interdum inermibus. Pinnæ 3–8-jugæ; foliola 10–20-juga, oblique oblonga v. obovali-oblonga, obtusa, 3–5 lin. longa. Spicæ sub-2-pollicares. Flores glabri. Legumen 3–4-pollicare, 7–8 lin. latum.—*Schweinf.! in Linnæa*, xxxv. 372, t. 22, fr.; *Oliv. Fl. Trop. Afr.* ii. 342.

A. triacantha, Hochst. ! ; A. Rich. Fl. Abyss. i. 244.
Hab. Tropical North-east Africa.

B. Diacanthæ. *Aculei dum adsint infrastipulares, gemini, recurvi.*

* *Flores distincte pedicellati, glabri. Legumen* Triacantharum.

359. A. DETINENS, *Burch.! Trav.* i. 310. Glabra v. villosula. Pinnæ sub-3-jugæ; foliola 1-juga, oblique obovata, obtusissima, 3–4 lin. longa. Spicæ ovoideo-subglobosæ v. oblongæ, laxifloræ, brevissime pedunculatæ. Legumen 2–3-pollicare, $\frac{3}{4}$–1 poll. latum. *Harv. et Sond. Fl. Cap.* ii. 282.

Hab. Extratropical South Africa..

360. A. FEROX, *Benth.! in Hook. Lond. Journ.* v. 97. Villosula. Pinnæ 4–6-jugæ; foliola 3–6-juga, oblique obovato-oblonga, obtusissima, 3–4 lin. longa. Spicæ ovoideo-subglobosæ v. oblongæ, laxifloræ, brevissime pedunculatæ. Legumen 2–3-pollicare, $\frac{3}{4}$–1 poll. latum.—*Harv. et Sond. Fl. Cap.* ii. 282.

Hab. Extratropical South-east Africa.

361. A. MELLIFERA, *Benth.! in Hook. Lond. Journ.* i. 507. Glabra, pallida. Pinnæ 2-jugæ; foliola 1-juga, oblique obovato-oblonga, obtusissima, 3–6 lin. longa. Spicæ 1–1$\frac{1}{2}$-pollicares, laxifloræ. Legumen 1$\frac{1}{2}$–2-pollicare, $\frac{1}{2}$–$\frac{3}{4}$ poll. latum.—*Schweinf. in Linnæa,* XXXV. 365; *Oliv. Fl. Trop. Afr.* ii. 340.

Mimosa unguis-cati, Forsk. Fl. Æg. Arab. 176, non Linn.
M. mellifera, Vahl, Symb. ii. 103.
Inga mellifera, Willd. Spec. iv. 1006.
Acacia vicioides, Ferr. et Galin. Voy. Abyss. iii. 119, ex descr. et syn.
Hab. Tropical North-east and North-west Africa, Arabia.

** *Flores sessiles v. subsessiles, glabri. Legumen* Triacantharum.

362. A. LÆTA, *R. Br.! in Salt, Abyss. App.* 65. Glabra, pallida. Pinnæ 2–3-jugæ. Foliola 2–5-juga, oblique oblanceolata v. obovato-oblonga, obtusa v. mucronulata, 3–4 lin. longa. Spicæ laxæ, 1–1$\frac{1}{2}$-pollicares, ad nodos fasciculatæ. Legumen 2–3-pollicare, $\frac{3}{4}$–1 poll. latum.—*Schweinf. in Linnæa,* XXXV. 367, t. 19 ad 21; *Reliq. Kotsch.* t. 1, 2; *Oliv. Fl. Trop. Afr.* ii. 341.

Hab. Tropical North-east Africa, and, perhaps the same, Arabia, *Botta.*

363. A. WELWITSCHII, *Oliv. Fl. Trop. Afr.* ii. 341. Glabra, subglauca. Pinnæ 2–4-jugæ; foliola 3–6-juga, elliptica, ovata v. obovata, obtusa, 4–8 lin. longa. Spicæ laxæ, 1$\frac{1}{2}$–2-pollicares, subpaniculatæ. Legumen 3–5-pollicare, 8–9 lin. latum.

Hab. South tropical Africa.

364. A. NIGRESCENS, *Oliv.! Fl. Trop. Afr.* ii. 340. Glabra, subglauca. Pinnæ 3-jugæ; foliola 1-juga, obovato-rotundata, coriacea, in forma typica siccitate nigricantia, 4–6 lin. longa. Spicæ tenues, interruptæ. Legumen ignotum.

Var. *pallens,* foliolis $\frac{1}{2}$–1-pollicaribus pallidis. Aculei demum valde incrassati tuberculiformes.

Hab. South tropical Africa.

365. A. VENOSA, *Hochst.!, Benth. in Hook. Lond. Journ.* v. 98. Glabra, pallida v. glauca. Pinnæ 3–5- rarius 6–7-jugæ; foliola 5–10-juga, oblique oblonga, v. obovato-

oblonga, obtusa, 3–5 lin. longa. Spicæ 1–1½-pollicares, laxæ. Legumen 4–6-pollicare, pollicem latum.— *Schweinf. in Linnæa*, xxxv. 371; *Oliv. Fl. Trop. Afr.* ii. 341.

A. sanguinea, Hochst.! A. Rich. Fl. Abyss. i. 245; Schweinf. l.c. 364.

Hab. North-east tropical Africa.

366. A. MODESTA, *Wall.! Pl. As. Rar.* ii. 27, t. 130. Glabra v. pilosula, cinerascens. Pinnæ 2–3-jugæ; foliola 3–5-juga, oblique obovato-oblonga, obtusa, 3–4 lin. longa. Spicæ laxæ, 1–2-pollicares. Legumen 3–4-pollicare, 6–8 lin. latum.—*Jacquem. Voy. Bot.* t. 56.

Mimosa obovata, Roxb.! Fl. Ind. ii. 561.

M. dumosa, Roxb. l. c. 559.

Hab. Subtropical Asia: North-western provinces of East Indies.

Very nearly allied to *A. venosa*, the leaflets usually fewer and shorter, the flowers pale yellow, not red, and the pod much smaller.

367. A. LENTICULARIS, *Hamilt.! in Wall. Cat. Herb. Ind.* n. 5244. Glabra, pallida v. glaucescens. Aculei rari. Pinnæ 2–3-jugæ; foliola 6–8-juga, oblique obovato-oblonga. obtusa, pollicaria v. paullo longiora. Spicæ laxæ, 3–5-pollicares. Legumen ignotum.—*Benth. in Hook. Lond. Journ.* i. 508.

Hab. Subtropical Asia: northern provinces of India.

368. A. FERRUGINEA, *DC. Prod.* ii. 458. Glabra, pallida. Pinnæ 3–6-jugæ; foliola 10–20-juga, oblongo-linearia, obtusa, 3–5 lin. longa. Spicæ tenues, interruptæ, 2-pollicares longioresque. Legumen ad 3 poll. longum, ¾ poll. latum, quam in præcedentibus rigidius, quam in sequentibus tenuius, glabrum, siccitate fusco-ferrugineum.

Mimosa ferruginea, Roxb. Fl. Ind. ii. 561.

Hab. Tropical Asia: East-Indian peninsula.

*** *Flores sessiles v. subsessiles, sæpe pubescentes. Legumen planum, valvis coriaceis marginibus vix prominentibus.*

369. ? A. PURPUREA, *Bolle, in Peters, Mossamb. Bot.* 6. Tomentoso-pubescens. Pinnæ 8-jugæ; foliola 12-juga, oblonga, obtusa, 3 lin. longa. Spicæ densæ, longiusculæ, pilosæ. Flores purpurei. Legumen ignotum.—*Oliv. Fl. Trop. Afr.* ii. 343.

Hab. South-east tropical Africa. I have not seen the plant.

370. A. ERUBESCENS, *Welw. in Oliv. Fl. Trop. Afr.* ii. 343. Glabra v. puberula. Pinnæ 4–5-jugæ; foliola 10–14-juga, oblongo-linearia, 2–3 lin. longa. Spicæ densiusculæ, 1½-pollicares. Flores albidi, griseo-tomentelli. Legumen ignotum.

Hab. South-west tropical Africa, *Welwitsch*. I have seen no specimen.

371. A. BURKEI, *Benth.! in Hook. Lond. Journ.* v. 98. Villosula. Pinnæ 3–6-jugæ; foliola 5–8-juga, oblique oblonga v. obovalia, obtusa, 3–5 lin. longa. Spicæ laxæ, longiusculæ. Legumen ignotum.—*Harv. et Sond. Fl. Cap.* ii. 282.

Hab. Subtropical (and tropical?) South-east Africa: Macalisberg, *Burke and Zeyher*, and, apparently the same, Manganja hills on the Zambesi, *Kirk*.

372. A. ROVUMÆ, *Oliv.! Fl. Trop. Afr.* ii. 353. Pubescens, fuscescens. Pinnæ 7–9-jugæ; foliola 15–30-juga, oblonga, obtusa, 2–3 lin. longa. Flores ignoti. Legumen glabrum, fuscescens, 4–6-pollicare, fere pollicem latum, valvis coriaceis vix venosis.

Hab. South-east tropical Africa.

Apparently allied to the following, but with a much larger and especially broader pod and larger leaflets.

373. A. Catechu, *Willd. Spec.* iv. 1079. Glabra v. pubescens, ramis fuscescentibus. Aculei sæpe parvi v. 0. Pinnæ 10–20-jugæ; foliola 20–30-juga, linearia, ½–3 lin. longa. Spicæ 2–3-pollicares. Corolla calyce 2–3-plo longior. Legumen glabrum, 3–5-pollicare, 6–8 lin. latum, valvis coriaceis vix venosis.—*Brandis! For. Fl.* 186.

Mimosa Catechu, Linn. f. Suppl. 439; Roxb. Corom. Pl. t. 175, Fl. Ind. ii. 563.

M. Sundra, Roxb. Corom. Pl. iii. 19, t. 225, Fl. Ind. ii. 562.

Acacia Chundra, Willd. Spec. iv. 1078.

A. Sundra, Spreng. Syst. iii. 143; Benth.! in Hook. Lond. Journ. i. 510.

A. Sandra, Bedd.! Fl. Sylv. t. 50.

Mimosa catechuoides, Roxb. Fl. Ind. ii. 562.

Acacia catechuoides, Benth.! in Hook. Lond. Journ. i. 510.

Hab. Tropical and subtropical Asia: common in most parts of India and Burma (*Brandis*).

This and the three following species are very difficult to distingish from each other in dried specimens; and the synonymy is much confused. I have followed Dr. Brandis, who has carefully investigated the question, in considering the common brown-barked Indian species as the true *Catechu*, of which Roxburgh's *M. Sundra* is the glabrous type, and his *M. catechuoides*, or *Catechu* of the Coromandel plants, the pubescent form, and taking his name of *Suma* for the white-barked species, thus reversing the nomenclature I had formerly adopted on the authority of most herbaria. I am not certain that the character derived from the proportions of the calyx and corolla is constant. Generally speaking, the corolla is very much more exserted in *A. Catechu* than in *A. Suma*, and still shorter in *A. caffra*; but there are occasionally specimens somewhat doubtful in this respect, and the colour of the bark is often very undecided in herbarium specimens.

By one of those errors of which there are several instances in Roxburgh's Flora Indica, printed after his death from manuscripts which had not been finally revised, *M. Catechu* has been three times repeated with distinct nnmbers as separate species, whereas "M. Catechu, Roxb. Corom. Pl." p. 562, was intended as a synonym to *M. catechuoides*, and "M. Catechu, Med. Obs." p. 563, as a synonym of the preceding *M. Catechu.*

A. polyacantha, Willd. Spec. iv. 1079 (*Mimosa spinosissima,* Poir. Dict. Suppl. i. 78), must be either the *A. Catechu* or *A. Suma*; but the character given is insufficient to determine to which it should be referred.

374. A. Suma, *Kurz*; *Brandis! For. Fl.* 187. Pubescens, pallida, ramulis albidis. Aculei sæpius parvi v. 0, rarius validi. Pinnæ 10–40-jugæ; foliola 30–50-juga, linearia, acutiuscula, 1–2½ lin. longa. Spicæ 2–5-pollicares. Corolla calyce dimidio rarius subduplo longior. Legumen glabrum, 3–5-pollicare, 6–8 lin. latum, valvis coriaceis vix lignosis.

Mimosa Suma, Roxb. Fl. Ind. ii. 563.

Acacia Catechu, Benth.! in Hook. Lond. Journ. i. 510; Oliv.! Fl. Trop. Afr. ii. 344; Bedd.! Fl. Sylv. t. 49, and most authors.

A. Wallichiana, DC. Prod. ii. 458.

A. campylacantha, Hochst.! A. Rich. Fl. Abyss. i. 242; Schweinf. Pl. Nil. t. 1.

A. erythrantha, Hochst.! A. Rich. l. c. 243.

Hab. Tropical Asia and Africa: the commonest species in Southern India (*Brandis*).

the Abyssinian form requiring, perhaps, further investigation, the flowers said to be red, which they are not in the Indian white-barked species.

The specimens sent from tropical America, where *Catcchu* has sometimes been planted, appear to me to be rather *A. Suma* than the true *A. Catechu* as above defined. I should observe, however, that Major Beddome does not quite agree with Dr. Brandis in the identification of the original *Catechu* with the *A. Sundra*, but thinks it was rather founded on the pale pubescent form of *A. Suma*, as I had originally presumed it to be. It might be better, perhaps, to consider *A. Catechu* as a collective name, and to include in it *A. Rovumæ*, *A. Sundra*, *A. Suma*, *A. hecatophylla*, and *A. caffra*.

375. A. HECATOPHYLLA, *Steud.*; *A. Rich.* ! *Fl. Abyss.* i. 242. Canescenti-tomentosa. Aculei sæpe parvi v. 0. Pinnæ 10–20-jugæ; foliola 30–50-juga, oblonga, obtusa, 2–3 lin. longa, pallida. Spicæ 2–3-pollicares, molliter pubescentes. Corolla calycem parvum excedens. Legumen 3–7-pollicare, fere pollicem latum, valvis rigide coriaceis obscure venosis.—*Oliv.* ! *Fl. Trop. Afr.* ii. 344.

Hab. North-east tropical Asia.

Very near *A. Suma*, but with larger broader leaflets and the pod of *A. Rovumæ*.

376. A. CAFFRA, *Willd. Spec.* iv. 1078. Subglabra, ramis fuscis. Aculei sæpe parvi v. 0. Pinnæ 6–12-jugæ; foliola 15–40-juga, linearia, $1\frac{1}{2}$–$2\frac{1}{2}$ lin. longa. Spicæ 2–3-pollicares. Corolla calycem parum excedens. Legumen 2–4-pollicare, 6–8 lin. latum, valvis coriaceis obscure venosis.—*Oliv.* ! *Fl. Trop. Afr.* ii. 345; *Harv. et Sond.* ! *Fl. Cap.* ii. 282.

Mimosa caffra, Thunb. Fl. Cap. 433.

Acacia fallax, E. Mey. ! Comm. Pl. Afr. Austr. 169, foliolis longioribus.

Hab. South tropical and extratropical Africa.

Very closely allied to *A. Catechu*, but with a different more rigid aspect.

C. Ataxacanthæ. - *Aculei dum adsint sparsi. Spicæ superiores sæpius racemoso-paniculatæ.*

377. A. ATAXACANTHA, *DC.* ! *Prod.* ii. 459. Puberula v. glabrata. Aculei sæpius rari. Pinnæ 7–15-jugæ, glandula petiolari elevata glabra; foliola 20–40-juga, lineari-subfalcata, ad 2 lin. longa. Spicæ 2–3-pollicares. Flores glabri. Legumen 3–4-pollicare, 4–6 lin. latum, valvis chartaceis glabris.—*Oliv. Fl. Trop. Afr.* ii. 343.

Hab. Westtropical Africa.

Albizzia mossambicensis, Bolle, in Peters Mossamb. Bot. 4, appears to be an *Acacia* closely allied to, if not identical with, *A. ataxacantha*.

378. A. MACROSTACHYA, *Reichenb.* ! *Benth. in Hook. Lond. Journ.* i. 511. Ferrugineo-pubescens. Aculei validi, rari. Pinnæ 20–30-jugæ; glandula petiolaris depressa, magna; foliola 20–50-juga, lineari-subfalcata, acuta, 2–$2\frac{1}{2}$ lin. longa. Spicæ 3–5-pollicares, laxæ. Flores glabriusculi. Legumen ignotum.—*Oliv. Fl. Trop. Afr.* ii. 343.

Hab. West tropical Africa.

379. A. ERIADENIA, *Benth.* ! *in Hook. Lond. Journ.* v. 98. Tomentoso-villosa v. glabrescens. Aculei rari, validi, basi latissimi. Pinnæ 6–10-jugæ; glandula petiolaris elevata, villosa, v. rarius obsoleta; foliola ad 20-juga, linearia, 2, rarius 3 lin. longa.

Spicæ 2–3-pollicares. Corolla calyce duplo longior. Legumen longiuscule stipitatum, 3–4-pollicare, 8–9 lin. latum, glabrum, glaucescens.—*Harv. et Sond. Fl. Cap.* ii. 283.

Hab. Extratropical South Africa : Natal district.

Perhaps not really distinct from *A. ataxacantha*.

380. A. Pervillei, *Benth. sp. n.* Scandens ? glabra. Aculei crebri, parvi, recurvi. Pinnæ 3–6-jugæ ; foliola 8–15-juga, subpetiolata, oblique oblonga, obtusa, mucronulata, 4–6 lin. longa, rigidula, subtus pallida. Spicæ laxæ, subpollicares, ad apices ramorum paniculatæ. Flores glabri. Corolla calyce obtusissime subdentato duplo longior. Legumen ignotum.

Hab. West Madagascar : Ambongo, *Perville*.

This species is very unlike any other one from the Old World, but appears much more nearly allied to the Brazilian *A. lacerans*.

Subseries 2. *Americanæ Spicifloræ*.

* Nudifloræ. *Frutices rarius arborescentes inermes v. rarius* (*in* A. Greggii) *aculei rameales pauci validi, petiolares* 0.

381. A. reniformis, *Benth.! in Hook. Ic. Pl.* t. 1165. Glabra, glaucescens. Aculei rari. Stipulæ foliaceæ, reniformes, 3–5 lin. latæ. Pinnæ 1–2-jugæ ; foliola 1-juga, oblique orbiculato-reniformia, rigida, 1–1½-pollicaria. Spicæ laxæ, 1–1½-pollicares. Legumen ignotum.

Hab. Mexico, *Ehrenberg in Herb. Berol.*

382. A. Wrightii, *Benth. ! in A. Gray, Pl. Wright.* i. 64. Glabra, pallida, inermis. Pinnæ 1–2-jugæ ; foliola 2–4-juga, oblique obovata v. oblonga, obtusa, 3–5 lin. longa. Spicæ laxæ, subpollicares. Legumen basi oblique stipitatum, subfalcatum, planum, 2–3-pollicare, 8–12 lin. latum.

Hab. Extratropical North America, West Texas, *Wright, Berlandier*.

383. A. Greggii, *A. Gray ! Pl. Wright.* i. 65. Glabra, pallida. Aculei pauci, sparsi. Pinnæ 1–3-jugæ, petiolo tenui ; foliola 3–7-juga, obovali- v. anguste oblonga, obtusa, vix 2 lin. longa. Spicæ subpollicares. Legumen 2–3-pollicare, ad 7 lin. latum, subplanum, rectum v. contortum, glabrum v. minute glauco-tomentellum.

A. Durandiana, Buckl. in Proc. Acad. Philad. 1861, 453.

Hab. Extratropical North America, West Texas, and North Mexico, *Wright, Gregg, and others*.

384. A. rotundata, *Benth.* Pilosula, glabrescens. Aculei infrafoliacei, solitarii, caduci. Pinnæ 1–3-jugæ ; foliola 6–10-juga, oblongo-linearia, obtusa, valde obliqua (2–3 lin. longa ?), novella subtus pilosa. Spicæ laxæ, subpollicares. Legumen ignotum.

Mimosa rotundata, Pavon (Herb. Oxon.).

Hab. Tropical America : Mexico, *Herb. Pavon*.

Primo intuitu *A. Greggii* similis, sed aculei sub nodis floriferis semper solitarii videntur, compresso-conici, basi valde dilatati, demum decidui nec secus ramos sparsi. Folia in speciminibus florentibus nondum bene evoluta. Stipulæ setaceæ, rigidulæ, caducæ. Petiolus communis et rhaches pinnarum tenues. Glandula interdum stipitata parva inter pinnas jugi inferioris, sæpe tamen deesse videtur.

Pinnæ breves, jugis secus petiolum distantibus sæpius 3. Spicæ ad nodos vetustos fasciculatæ, fasciculis interdum in ramulum floridum excrescentibus. Flores omnino *A. Greggii*.

385. A. Emoryana, *Benth. sp. n.* Minute tomentella, glabrescens, inermis. Pinnæ 3–6-jugæ; foliola 10–15-juga, oblongo-linearia, valde obliqua, obtusa v. acutiuscula, rigidula, 2–3 rarius 4 lin. longa. Spicæ densæ, 3–4 lin. longæ, v. longiores basique interruptæ. Legumen oblique stipitatum, 2–2½-pollicare, pollicem latum, minute glauco-tomentellum, marginatum.

A. Coulteri, Benth. ! in A. Gray, Pl. Wright. i. 66, quoad plantam Texanam.

Hab. Extratropical North America: Texas, *Wright*; also *Emory's Expedition*, n. 325.

I had formerly seen only flowering specimens of *A. Coulteri* and fruiting ones of the present species; I have now before me both flowering and fruiting specimens of both, and find that they differ considerably in both states as well as in their geographical station.

386. A. Coulteri, *Benth. ! in A. Gray, Pl. Wright.* i. 66, *quoad plantam Mexicanam.* Glabra v. inflorescentia minute puberula, inermis. Pinnæ 5–15-jugæ; foliola 20–30-juga, oblongo-linearia, valde obliqua, obtusa v. acutiuscula, 2–3 lin. longa. Spicæ 2–2½-pollicares, laxifloræ. Legumen recte stipitatum, 3–5-pollicare, 6–8 lin. latum, glabrum, marginatum.

Hab. Tropical North America: Mexico, near Zimapan, *Coulter*; between Sula and Vittoria, *Berlandier*; near Grenada, in Nicaragua, *Œrsted.*

387. A. mammifera, *Schlecht. Linnæa,* xii. 563. Subglabra, inermis. Pinnæ 2–4-jugæ; foliola 10–15-juga, anguste elliptica, obliqua, obtusiuscula, 3 lin. longa, utrinque puberula. Spicæ axillares, rhachi fructifera 1–2-pollicari. Flores ignoti. Legumen recte stipitatum, 3–6-pollicare, 4 lin. latum, valvis papyraceis ad semina elevationibus mammæformibus notatis.

Hab. Tropical America: Mexico, Barranca de Acholaya, *Ehrenberg.*

I have not seen this species. It must be nearly allied to *A. Coulteri*; but the character does not altogether agree.

388. A. acatlensis, *Benth. ! in Hook. Lond. Journ.* i. 513. Glabriuscula v. canescenti-villosa, stipulis subsetaceis fere acicularibus, cæterum inermis. Pinnæ 3–10-jugæ; foliola multijuga, linearia, obtusa v. acutiuscula, 2–3 lin. longa. Spicæ densiusculæ, ad 2 poll. longæ. Legumen ignotum.

A. sericea, Mart. et Gal. ! in Bull. Acad. Brux. x. pars ii. 309.

Hab. Tropical America: Mexico, *Andrieux*, n. 396; *Galeotti*, n. 3345.

I had formerly thought that Galeotti's plant might be kept up as a distinct species; but on a careful comparison I can find no character besides the denser pubescence.

389. A. scleroxyla, *Tuss. ! Fl. Antill.* t. 21. Tomentella, inermis. Pinnæ 10–15-jugæ; foliola 30–70-juga, linearia, obtusa, 2–3 v. rarius 4 lin. longa (per anthesin sæpius parva). Spicæ axillares, 2–3-pollicares. Legumen sessile v. brevissime stipitatum, planum, glabrum, 3–4-pollicare, ¾–1 poll. latum, valvis rigide coriaceis.

Hab. San Domingo, *Ehrenberg* and others.

Habit nearly of *A. Catechu,* but no prickles, and a different pod.

390. A. nudiflora, *Willd. Spec.* iv. 1058. Velutino-tomentella v. glabrescens, siccitate sæpe nigricans, inermis. Pinnæ 4–6-jugæ; foliola 10–16-juga, ovato-elliptica v.

late oblonga, obliqua, obtusissima, demum coriacea, nitidula, subsemipollicaria. Spicæ axillares, 3–5-pollicares. Legumen breviter stipitatum, rectum v. leviter arcuatum, planum, glabrum, ad 4 poll. longum, 6–9 lin. latum, inter semina subseptatum, valvis rigide coriaceis.

Mimosa nudiflora. Rich. in Poir. Dict. Suppl. i. 65.

Mimosa nigricans, Vahl! Ecl. iii. 37, t. 29, non Labill.

A. Rohriana, DC. Prod. ii. 457.

Hab. West Indies: Danish Islands of St. Thomas and St. John, *r. Bohr, Balbis, Ehrenberg,* and others; Porto Rico, *Herb. Par.*

Mimosa muricata, Linn. Spec. 1504, or *Acacia muricata,* Willd. Spec. iv. 1058, is founded solely upon Plumier's figure, ed. Burm. t. 11, which probably represents an exaggerated luxuriant form of *A. nigricans,* with larger, more numerous leaflets, raised lenticles on the branches, and the spikes more terminal, with setaceous bracts protruding beyond the buds; but how far this may or may not be a correct representation remains very doubtful. Grisebach refers the *M. muricata,* without hesitation, to *A. nudiflora.*

(See also *Mimosa glandulosa,* Vahl, amongst doubtful species.)

** Lacerantes. *Frutices elatiores, sæpe sarmentosi v. alte scandentes. Aculei parvi sæpius recurvi, rameales crebri v. rari, petiolares sæpius adsunt minimi. Spicæ superiores v. omnes racemosæ v. paniculatæ.*

† *Spicæ* $1\frac{1}{2}$–4-*pollicares.*

391. A. AMAZONICA, *Benth.! in Mart. Fl. Bras. Mim.* Alte scandens, glabra v. inflorescentia puberula. Aculei haud crebri. Stipulæ lanceolatæ, striatæ. Pinnæ 8–20-jugæ; foliola multijuga, anguste linearia, 2–3 lin. longa. Spicæ paniculatæ. Corolla calyce 3–4-plo longior. Legumen stipitatum, 6–7-pollicare, pollicem latum, valvis membranaceo-chartaceis.

Hab. Tropical America: North Brazil, *Spruce.*

392. A. LACERANS, *Benth.! in Hook. Lond. Journ.* i. 511. Laxe ramosa v. alte scandens. Aculei crebri. Stipulæ angustæ, caducissimæ. Pinnæ 20–25-jugæ; foliola multi- (40–70)-juga, anguste linearia, ad 2 lin. longa. Spicæ paniculatæ. Corolla calyce dimidio longior. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro, Sao Paulo, and Bahia.

393. A. VELUTINA, *DC.! Prod.* ii. 459, *non Benth. olim.* Elata v. alte scandens, puberula. Aculei crebri v. minimi rarique. Stipulæ angustæ, caducissimæ. Pinnæ 5–12-jugæ; foliola 15–40-juga, lineari-falcata, subtus pubescentia, 3–6 lin. longa. Spicæ paniculatæ. Corolla calyce subduplo longior. Legumen stipitatum, 4–5-pollicare, $1\frac{1}{2}$ poll. latum, valvis coriaceis marginatis.—*Benth. in Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

394. A. PIAUHIENSIS, *Benth.! in Mart. Fl. Bras. Mim.* Molliter pubescens. Aculei minimi, rari. Pinnæ 2–4-jugæ; foliola 10–20-juga, subfalcato-oblonga, subtus pilosula, 3–4 lin. longa. Spicæ subracemosæ, 3-pollicares longioresque. Corolla calyce subdimidio longior. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Piauhy.

†† *Spicæ vix pollicares brevioresve, in speciebus ultimis variant oblongæ v. paucifloræ et subglobosæ.*

395. A. MONACANTHA, *Willd. Enum. Hort. Berol.* 1056, *fide Moricand.* Arborea? velutino-pubescens, mox glabrata. Aculei pauci, validi, sæpius infrafoliacei. Pinnæ 4–11-jugæ; foliola multijuga, linearia, puberula, 2–2½ lin. longa. Spicæ densæ, ad ¾ poll. longæ, subpaniculatæ v. fasciculatæ. Legumen ignotum.—*Benth.! in Fl. Bras. Mim.*

A. velutina, Benth.! in Hook. Lond. Journ. i. 514, non DC.

Hab. Tropical America: Brazil, prov. Bahia, Minas Geraes and Sao Paulo.

396. A. BONARIENSIS, *Gill.! in Hook. Bot. Misc.* iii. 207. Elata, subglabra. Aculei sæpe validi, haud crebri. Pinnæ 6–12-jugæ; foliola 25–50-juga, oblique linearia, 2–3 lin. longa., glabra. Spicæ semipollicares v. rarius longiores, axillares et paniculatæ. Corolla calycem breviter superans. Legumen stipitatum, 2–3-pollicare, 6–7 lin. latum, glabrum, valvis coriaceis marginatis.—*Benth. in .Fl. Bras. Mim.*

Hab. Extratropical South-America: South Brazil, Argentine Republic, and Paraguay.

397. A. HAYESII, *Benth.* sp. n. Glabra v. junior vix puberula, alte scandens. Aculei minimi. Pinnæ 8–10-jugæ. Foliola 10–20-juga, oblongo-linearia, falcata, mucronata, ad 4 lin. longa, costa valde excentrica. Spicæ laxiusculæ, oblongæ, subsemipollicares. Legumen ignotum.

Hab. Tropical America: Panama, Mammee station of the railroad, *S. Hayes.*

"Frutex in arbores altissime scandens et ab apicibus sæpe dependens." Ramuli subteretes, fusci, glabri. Aculei in specimine nostro haud crebri. Foliorum petiolus communis semipedalis. Pinnæ 1½–2-pollicares. Glandulæ adsunt inter pinnas fere omnium parium et 1–2 infra par infimum. Spicæ ad nodos paniculæ subaphyllæ solitariæ v. fasciculatæ, pedunculo semipollicari fultæ. Flores sessiles, glabri. Calyx 1 lin. longus, brevissime dentatus. Corolla duplo longior.

398. A. PLUMOSA, *Lowe! in Bot. Mag.* t. 3366. Scandens, tomentoso-pubescens. Aculei parvi v. rarius validi, recurvi. Pinnæ 10–20-jugæ; foliola 30–50-juga, linearia, ciliolata, 1–2 lin. longa. Spicæ ovoideæ oblongæ v. subcylindraceæ, 2–4 lin. longæ, paniculatæ. Corolla calycem breviter superans. Legumen stipitatum, 4–6-pollicare, 6–7 lin. rarius fere pollicem latum, brevissime tomentosum v. glabratum.—*Benth. in Fl. Bras. Mim.*

A. scandens, Benth.! in Hook. Lond. Journ. i. 517, vix Willd.

Mimosa fluminensis, Vell. Fl. Flum. Ic. xi. t. 38.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

399. A. PTERIDIFOLIA, *Benth.! in Hook. Lond. Journ.* i. 521. Scandens, subglabra. Aculei parvi, rari. Pinnæ 2–4-jugæ; foliola 20–50-juga, linearia, falcata, 4–8 lin. longa, costa submarginali. Spicæ ovoideæ v. oblongæ, 4–6 lin. longæ, paniculatæ. Corolla calyce subduplo longior. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

(See also the first two species of the following group, which have the flower-heads sometimes lengthened into short spikes.)

Subseries 3. *Americanæ Capitulatæ. Capitula* (*exceptis interdum* Stipularibus) *globosa.*

* Stipulares. *Stipulæ amplæ membranaceæ caducæ.*

400. A. GRANDISTIPULA, *Benth. ! in Hook. Lond. Journ.* i. 511. Scandens, glabra. Aculei subrecurvi. Stipulæ oblique cordatæ, $\frac{1}{2}$–$\frac{3}{4}$-pollicares. Pinnæ 3–7-jugæ; foliola 10–15-juga, dimidiato-oblonga, subsemipollicaria. Capitula paniculata, ovoidea v. oblonga, floribus pedicellatis. Legumen stipitatum, 4–7-pollicare, $1\frac{1}{4}$ poll. latum, glabrum. —*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro, Sao Paulo, and Minas Geraes.

Very variable in the breadth of the leaflets and the form of the flower-head, and may possibly include several species, all, however, very nearly allied to *A. tamarindifolia*.

401. A. TAMARINDIFOLIA, *Willd. Spec.* iv. 1092. Scandens ?, glabra. Aculei recti v. subincurvi. Stipulæ late cordatæ, subsemipollicares. Pinnæ 4–8-jugæ; foliola 10–20-juga, oblique oblonga, subsemipollicaria. Capitula globosa v. ovoidea, paniculata. Flores brevissime pedicellati. Legumen longiuscule stipitatum, sub-3-pollicare, 8–9 lin. latum, glabrum.

Mimosa tamarindifolia, Linn. Spec. 1509; Jacq. ! Hort. Schœnbr. iii. 77, t. 396.

A. pinnata, Link, Enum. Hort. Berol. ii. 446.

Hab. Tropical America: West Indies and Venezuela, *Otto*, n. 964; *Moritz*, n. 597.

402. A. BAHIENSIS, *Benth. ! in Mart. Fl. Bras. Mim.* Erecta ? glabra v. pubescens. Aculei recti v. subincurvi. Stipulæ late cordatæ, 3–5 lin. longæ. Pinnæ 2–4-jugæ; foliola 8–12-juga, falcato-oblonga, 3–4 lin. longa. Capitula globosa, per anthesin longe racemosa. Flores sessiles. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia.

** *Spinæ axillares validæ, apice divaricato-bifidæ.*

403. A. FURCATA, *Gill ! in Hook. Bot. Misc.* iii. 206. Fruticosa, glabra. Aculei minimi, rari. Spinæ (seu pedunculi steriles indurati) semipollicares, lobis apicalibus (bracteis induratis) divaricatis pungentibus vix lineam longis. Pinnæ 2–4-jugæ; foliola 6–10-juga, oblongo-linearia, 1–2 lin. longa. Capitula breviter racemosa. Flores sessiles. Legumen breviter stipitatum, 3-pollicare, $\frac{3}{4}$ poll. latum, glabrum.

Hab. Extratropical South-America: foot of the Andes of Mendoza, *Gillies*, *Miers*.

*** *Foliola unijuga, majuscula v. ampla.*

404. A. CRASSIFOLIA, *A. Gray ! in Mem. Amer. Acad.* v. 317. Glabra, glaucescens. Aculei validi. Pinnæ 1-jugæ, foliola 1-juga, cuneato-orbicularia, 1–$1\frac{1}{2}$-pollicaria, obtusissima, coriacea. Capitula paniculata, dense multiflora. Legumen ignotum—*Hook. Ic. Pl.* t. 1166.

Hab. Extratropical North America: Mexicano-Texan mountains, *Thurber*.

405. A. MIERSII, *Benth. ! in Hook. Lond. Journ.* i. 522. Subscandens, glabra, inermis. Pinnæ 1-jugæ; foliola 1-juga, oblique ovali-oblonga, acuminata, 2–3-pollicaria. Capitula ample paniculata. Legumen ignotum.—*Fl. Bras. Mim.*

Mimosa bijuga, Vell. Fl. Flum. Ic. xi. t. 32 ?

Hab. Tropical America: Brazil, prov. Rio Janeiro.

M. bijuga, of Velloso, as quoted above, is a fair representation of this plant, except as to the stipellæ, of which the specimens show no trace. *M. dichotoma*, Velloso, l. c. t. 42 (*Inga dichotoma*, Mart. Herb. Fl. Bras. 114), gives a better idea of the foliage; but the inflorescence and flowers are evidently the product of the artist's imagination.

406. A. Mikanii, *Benth.! in Mart. Fl. Bras. Mim.* Glabra, inermis. Pinnæ dissite 2-jugæ; foliola 1-juga, ovato-falcata, obtuse acuminata, $1\frac{1}{2}$–2-pollicaria, membranacea. Capitula gracile paniculata. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Rio Janeiro, *Mikan*.

**** *Foliola ovata v. late oblonga, obtusa,* (*excepta* A. Langsdorfii) *infra* 12-*juga*.

407. A. Rœmeriana, *Scheele in Linnæa*, xxi. 456. Glabra. Aculei subrecurvi, haud crebri. Pinnæ 2–3-jugæ; foliola 4–8-juga, oblique oblonga v. obovata, 4–5 lin. longa. Capitula ad nodos pedunculata, fasciculata. Legumen stipitatum, rectum v. subfalcatum, 4–6-pollicare, $\frac{3}{4}$–$1\frac{1}{4}$ poll. latum, subglaucescens.

Hab. Extratropical North America: North Mexico and West Texas.

408. A. malacophylla, *Benth.! in A. Gray, Pl. Wright.* i. 64. Molliter pubescens. Aculei subrecurvi, rari. Pinnæ 2–3-jugæ; foliola 6–10-juga, oblique obovato-oblonga, utrinque pubescentia, 3–6 lin. longa. Flores ignoti. Pedunculi fructiferi ad nodos defoliatos. Legumen breviter stipitatum, 4-pollicare, $\frac{3}{4}$ poll. latum, falcatum, glabrum.

Hab. Extratropical North America: West Texas, *Wright*.

409, A. micrantha, *Benth.* sp. n. Glabra, subglauca. Aculei recti. Pinnæ 1–2-jugæ; foliola 6–8-juga, late oblonga, obtusissima, subcoriacea, 3–4 lin. longa. Capitula ad axillas pedunculata. Legumen stipitatum, 2-pollicare, 6–9 lin. latum, glabrum, glaucescens.

Hab. Tropical North America: Mexico, *Berlandier*, n. 3148, between Las Apuntas and las Verdosas, *Ehrenberg*.

Frutex videtur erectus. Aculei in ramis sparsi. Foliorum petiolus communis inermis, $\frac{1}{4}$–$\frac{3}{4}$-pollicaris, glandula oblonga sub pinnarum pare infimo. Pinnarum rhaches rigidulæ, tenues, subpollicares, eglandulosæ. Foliola costa subcentrali subtrinervia et reticulato-pennivenia. Pedunculi rigiduli, tenues, $\frac{3}{4}$–1 poll. longi. Capitula absque staminibus 2–$2\frac{1}{2}$ lin. diametro. Bracteæ rigide setaceæ, ante anthesin alabastra superantes, per anthesin deciduæ. Flores sessiles, glabri. Calyx $\frac{1}{2}$ lin. longus, membranaceus. Corolla vix lineam longa, petalis facile solvendis.

410. A. ambigua, *Vog.! in Linnæa*, x. 600. Puberula, demum glabrescens, inermis. Pinnæ 6-jugæ; foliola 8–15-juga, oblique ovali-oblonga, obtusa, subsemipollicaria, pallide virentia. Capitula parva, ample paniculata, tomentosa. Legumen longe stipitatum, (immaturum) 5-pollicare, $\frac{3}{4}$ poll. latum.

A. Vogeliana, Steud. Nom. Bot. ed. 2.

Hab. Tropical America: Haiti, *Ehrenberg in Herb. Berol.*

411. A. Langsdorfii, *Benth.! in Hook. Lond. Journ.* i. 521. Canescenti-tomentosa (inermis?). Pinnæ 4–7-jugæ; foliola 20–30-juga, oblique oblonga, obtusa, subtus tomentosa, 2–3 lin. longa. Capitula paniculata, cano-tomentosa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia and Minas Geraes.

412. A. PEDICELLATA, *Benth.! in Hook. Lond. Journ.* i. 522. Puberula, glabrescens. Aculei rari. Pinnæ 4–6-jugæ; foliola 6–10-juga, obovali-oblonga, 3–6 lin. longa, pubescentia. Capitula in panicula per anthesin paucifoliata numerosa, multiflora. Flores pedicellis lineam longis fulti, nec ut in affinibus sessiles. Legumen ignotum.—*Fl. Bras. Mim.*

Mimosa paratyensis, Vell. Fl. Flum. Ic. xi. t. 41.

Hab. Tropical America: Brazil, prov. Minas Geraes, Bolivia.

***** *Foliola multijuga, linearia v. falcato-oblonga.*

† *Foliola supra sæpius concaviuscula, subtus convexa, costa parum excentrica.*

413. A. SERRA, *Benth.! in Hook. Lond. Journ.* i. 519. Scandens, tomentella v. glabrescens. Aculei crebri, 4–5-seriati, recurvi, sæpe confluentes. Pinnæ 26–40-jugæ; foliola 50–80-juga, falcato-linearia, ad 2 lin. longa. Capitula paniculata. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

414. A. MASCHALOCEPHALA, *Griseb.! Cat. Pl. Cub.* 82. Scandens, villosula v. glabrescens. Aculei crebri, parvi, recurvi. Pinnæ 6–10-jugæ; glandula depressa; foliola 15–20-juga, falcato-linearia, 2–3 lin. longa, glabra. Capitula in axillis summis fasciculato-pedunculata v. paniculata. Legumen ignotum.

Hab. Tropical America: Cuba, *Wright.* n. 2395

Very near the Brazilian *A. Serra,* but the prickles smaller, the pinnæ and leaflets much fewer, and the stem more pubescent. A large pod sent with the Kew specimen probably does not belong to it, as Grisebach had not seen the fruit.

415. A. LASIOPHYLLA, *Benth.! in Mart. Fl. Bras. Mim.* Ferrugineo-tomentosa. Aculei pauci, validi, recurvi. Pinnæ 6–8-jugæ; glandulæ parvæ; foliola 20–30-juga, linearia, 2–3 lin. longa, villosa. Capitula subracemosa, majuscula. Corolla 3 lin. longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Minas Geraes.

416. A. RECURVA, *Benth.! in Hook. Lond. Journ.* i. 519. Glabra. Aculei parvi, recurvi. Pinnæ 15–20-jugæ; glandulæ depressæ, majusculæ; foliola 30–50-juga, linearia, vix 2 lin. longa, glabra. Capitula racemosa v. paniculata, parva. Corolla 1½ lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

417. A. ADHÆRENS, *Benth.! in Hook. Lond. Journ.* i. 517. Scandens, ferrugineo-pubescens v. villosa. Aculei parvi, recurvi. Pinnæ 10–20-jugæ; glandulæ parvæ, elevatæ; foliola 30–60-juga, anguste linearia, 2 rarius 3 lin. longa, sæpius subtus pilosula et margine ciliata. Capitula parva, ample paniculata. Corolla 1½ lin. longa. Legumen sub-3-pollicare, 10–12 lin. latum, glabrum.—*Fl. Bras. Mim.*

Mimosa adhærens, Mart.! Herb. Fl. Bras. 122, n. 174, non ejusd. n. 1104.

M. Martiusana, Steud. Nom. Bot. ed. 2.

Acacia micradenia, Benth. in Hook. Lond. Journ. i. 518.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Minas Geraes, and Goyaz.

418. A. TUBULIFERA, *Benth. in Hook. Lond. Journ.* i. 520. Subscandens ?, puberula.

Aculei rari, recurvi. Pinnæ 6–9-jugæ; foliola 30–50-juga, linearia, ad 2 lin. longa, glabra. Capitula subpaniculata. Corolla tubulosa, 2–2½ lin. longa. Calyx quadruplo brevior. Legumen ignotum.

Hab. Tropical America: Peru, *Matthews*, n. 1568.

419. A. RIPARIA, *H., B. et K.! Nov. Gen. et Sp.* iv. 276. Arborea v. alte scandens, subglabra. Aculei recurvi, haud crebri. Pinnæ 6–12-jugæ; foliola 15–40-juga, oblongo-linearia, 3–4 lin. longa. Capitula ample paniculata. Corolla 1–1½ lin. longa. Legumen stipitatum, 4–8-pollicare, ¾–1¼ lin. latum, glabrum v. glauco-tomentosum—*Benth. in Fl. Bras. Mim.*

Mimosa paniculata, West, ex Vahl, Ecl. iii. 39.
M. retusa, Jacq. Stirp. Amer. 267, ex descr.
Acacia Westiana, A. Guadelupensis et A. intsioides, DC. Prod. ii. 464.
A. sarmentosa, Griseb.! Fl. Brit. W. Ind. 221 vix Desv.; Duch. et Walp. in Linnæa, xxiii. 745.
Mimosa plana, Vell. Fl. Flum. Ic. xi. t. 28?.
Acacia quadriglandulosa, Mart.! Herb. Fl. Bras. 110.

Hab. Tropical America: Brazil, prov. Rio Janeiro and Minas Geraes, North Brazil, Guiana, Columbia, and West Indies.

Kunth's specimen in the Paris Herbarium belongs to a form with rather small and narrow leaflets; and in this state the species is sometimes very difficult to distinguish from the East-Indian *A. cæsia*, to which the true *M. sarmentosa* of the Paris Garden appears to be referrible.

†† *Foliola plana v. supra convexiuscula, costa valde excentrica margini superiori approximata v. contigua.*

420. A. GLOMEROSA, *Benth.! in Hook. Lond. Journ.* i. 521. Arborea, pubescens v. glabrata. Aculei rari, recti v. incurvi. Pinnæ 6–8-jugæ; foliola 12–25-juga, oblique late oblonga, subtus appresse pubescentia, 2–6 lin. longa. Capitula ample paniculata. Corollæ sæpius pubescentes. Legumen stipitatum, 5–6-pollicare, 1–1¼ poll. latum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janiero, Bahia, Minas Geraes, and Goyaz; Peru, near Tarapoto, *Spruce*, n. 4408; Columbia, Bogota, *Triana*; Panama, *Sutton Hayes*.

This species varies considerably, and sometimes comes very near to *A. polyphylla*. A few of the Brazilian specimens, as well as those from Spruce and from Sutton Hayes, have the flowers nearly glabrous; but in general the corolla is remarkably silky-pubescent, more so than the calyx.

421. A. POLYPHYLLA, *DC. Cat. Hort. Monsp.* 74; *Prod.* ii. 469. Arborea v. subscandens, tomentoso-puberula v. glabrata. Aculei rari, recti v. incurvi. Pinnæ 10–20-jugæ; foliola 30–50-juga, anguste falcato-oblonga v. linearia, ad 3 lin. longa, subtus minute puberula. Capitula ample paniculata. Corolla pubescens. Legumen eo *A. glomerosæ* paullo minus. —*Benth. in Fl. Bras. Mim.*

A. riparia, Bert.! in Spreng. Syst. iii. 142, non H., B. et K.
A. fluviatilis, Spreng. Syst. Index.

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes, and Bahia; North Brazil, Peru, Columbia, Guiana.

The species varies considerably, and is sometimes very near some specimens of *A. glomerosa*. The two may prove to be varieties only of one species.

422. A. STRIATA, *Humb. et Bonpl. in Willd. Spec.* iv. 1089. Pubescens. Aculei sparsi, acuti, erecti, compressi. Pinnæ 9-jugæ; foliola 13–16-juga, linearia, obtusiuscula, supra glabra, subtus appresse pilosa, avenia. Capitula grani piperis magnitudine, paniculata. Legumen falcatum, nitidum, $1\frac{1}{2}$-pollicare, setis raris brevissimis obsitum.

Mimosa striata, Poir. Dict. Suppl. i. 83.

Hab. South America, *Humboldt and Bonpland.*

I have not seen this plant. It is evidently very near the two preceding species, and ought perhaps to include them both.

423. A. MARTII, *Benth.! in Hook. Lond. Journ.* i. 519. Aculei subincurvi *A. polyphyllæ.* Folia *A. paniculatæ*, costa foliorum vix a margine discreta. Panicula pubescens. Flores *A. paniculatæ.—Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Janeiro and Goyaz.

424. A. PANICULATA, *Willd.! Spec.* iv. 1074. Alte scandens, puberula. Aculei recurvi, haud crebri, validi v. parvi. Pinnæ 10–20-jugæ; foliola 20–60-juga, anguste linearia, acuta, obliqua, 2 lin. longa v. minora, rigidula, supra nitida. Capitula parva, ample paniculata. Legumen stipitatum, 6–8-pollicare v. rarius subpedale, $1\frac{1}{2}$ poll. latum, pube brevissime demum evanida, opacum.—*Benth. in Fl. Bras. Mim.*

Mimosa paniculata, Poir. Dict. Suppl. i. 74.

M. adhærens, Mart.! Herb. Fl. Bras. n. 1104 non ejusd. n. 174.

M. grandisiliqua, Vell. Fl. Flum. Ic. xi. t. 37.

Acacia Clausseni, et *A. grandisiliqua,* Benth.! in Hook. Lond. Journ. i. 518.

A. Julibrissin, Sieb.! Herb. Fl. Martin. Suppl. n. 109, non Willd.

A. martinicensis, Presl, Bot. Bem. 65.

A. microcephala, A. Rich.! Fl. Cub. i. 469.

Mimosa tenuifolia, Linn. Spec. ed. i. 523, ex char.

Acacia tenuifolia, Willd. Spec. iv. 1091.

Hab. Tropical America: widely spread over Brazil, Bolivia, Peru, Ecuador, Columbia, Guiana, and the West Indies; also apparently the same in West tropical Africa, from a specimen with young flowers only from Bagroo, *Mann.*

The species is near the Old-World *A. pennata,* to which Linnæus subsequently reduced his *Mimosa tenuifolia,* but is readily distinguished by the small neat rigid leaflets, with the nerve close to the margin.

Mimosa quadrangularis, Vell. Fl. Flum. Ic. xi. t. 36, may be the same species, with the prickles more regularly inserted on prominent angles of the stem; but the figure is insufficient for precise determination.

425. A. BERLANDIERI, *Benth.! in Hook. Lond. Journ.* i. 522. Cano-tomentella, inermis. Pinnæ 10–12-jugæ; foliola 30–50-juga, linearia, ad 2 lin. longa, subtus v. utrinque tomentella. Capitula paniculata. Legumen breviter stipitatum, crassiusculum, rectum v. curvulum, breviter velutino-pubescens, 4–5-pollicare, $\frac{3}{4}$–1 poll. latum, valvis coriaceis primum planis demum convexis plus minus incrassatis.

A. tephroloba, A. Gray! Pl. Wright. i. 65.

Hab. Tropical and extratropical North America, Mexico, and West Texas.

The pod is flat only when unripe; it often thickens considerably in ripening, and the valves become more or less convex. The stipes varies from under 2 lines to near 6 lines in length.

Subseries 4. *Gerontogeæ Capitulatæ. Capitula in omnibus stricte globosa.*

426. A. KRAUSSIANA, *Meissn. ! Benth. in Hook. Lond. Journ.* i. 515. Scandens, glabra v. puberula. Aculei parvi, rari. Pinnæ 3–4-jugæ; foliola 6–12-juga, oblique oblonga, obtusa, glabra, 3–6 lin. longa. Capitula racemoso-paniculata, glabra. Legumen stipitatum, rectum, obtusum, glabrum, nitidum, 3–4-pollicare, 8–10 lin. latum, valvis submembranaceis, marginibus nerviformi-incrassatis.—*Harv. et Sond. Fl. Cap.* ii. 283.

Hab. Extratropical South Africa: Natal district.

Very near some of the more glabrous forms of *A. cæsia,* but with fewer pinnæ and leaflets, and a thinner almost truncate pod.

427. A. CÆSIA, *Willd. Spec.* iv. 1090. Scandens v. sarmentosa, tomentella v. glabrata. Aculei recurvi, sæpius sat crebri sed varii. Pinnæ 6–20-jugæ, v. hinc inde paucijugæ; glandulæ sessiles; foliola 10–40-juga, oblonga, obliqua v. falcata, 3–6 lin. longa, subtus canescenti-tomentella v. utrinque viridia et concoloria, costa parum v. valde excentrica. Legumen stipitatum, 4–6-pollicare, ¾–1 poll. latum, junius sæpe tomentellum, maturum glabrum, valvis coriaceo-chartaceis.

Mimosa cæsia, Linn. Spec. 1507.

M. Intsia, Linn. Spec. 1508.

Acacia Intsia, Willd. Spec. iv. 1091.

Mimosa tenuifolia, Roxb. Hort. Beng. 41.

M. sarmentosa, Desf. Cat. Hort. Par. ed. 1. 181; Pers. syn. ii. 266.

Acacia sarmentosa, Desv. ! Journ. Bot. 1814, i. 70, ad specimina hortensia nondum florentia.

A. Arar, Hamilt. ! in Wall. Cat. Herb. Ind. n. 5249.

A. oxyphylla, Grah. ! in Wall. l. c. n. 5252.

A. aliacea, Hamilt. ! in Wall. l. c. 5258.

A. pseudointsia, Miq. Fl. Ind. Bat. i. pars i. 12.

Hab. Tropical and subtropical Asia: spread over nearly the whole of India to the foot of the Himalayas, and extending to Sumatra, Java, and the Philippines, *Cuming,* n. 1499.

There would appear at first sight to be two very distinct forms, as characterized by Arnott in W. et Arn. Prod. 278:—*A. cæsia,* more abundant in the Peninsula and North-west India, more tomentose-pubescent, the leaflets obtuse, almost coriaceous, dark above, very pale or white underneath; and *A. Intsia,* usually more eastern and southern, often quite glabrous, the leaflets more acute and falcate, thinner, and green on both sides; but the two are often geographically intermixed, and the intermediate specimens are numerous. I have therefore felt obliged to follow Dr. Brandis, For. Fl. 189, in uniting them as a single species, closely allied to the American *A. riparia,* and, but for the widely different geographical station, sometimes scarcely to be distinguished from it except by the broader leaflets.

428. A. PENNATA, *Willd. Spec.* iv. 1090. Scandens, tomentoso-pubescens v. glabrata. Aculei recti v. recurvi. Pinnæ 6–20-jugæ; glandula petiolaris sessilis, sæpe majuscula, inter pinnas paucæ; foliola 20–60-juga, anguste linearia, 2–3 lin. longa, glabra v. subtus puberula, 2–3 lin. longa. Capitula paniculata. Legumen stipitatum, 4–6-pollicare, 8–10 lin. latum, glabrum v. minute rufo-tomentellum, valvis coriaceo-chartaceis.—*W. et Arn. ! Prod. Fl. Penins.* 277; *Oliv. ! Fl. Trop. Afr.* ii. 345.

Mimosa pennata, Linn. Spec. 1507.

M. ferruginea, Rottl. ex char. in Spreng. Syst. ii. 207, et ex W. et Arn. non Rottl. in Ges. nat. Fr. Berl. N. Schr. quæ *A. leucophlœa.*

M. torta, Roxb. Fl. Ind. ii. 566.
Acacia arrophula, Don ! Prod. Fl. Nep. 247.
A. megaladena, Desv. ! Journ. Bot. 1814, i. 69.
Mimosa pentagona, Schum. et Thonn. ! Beskr. Pl. Guin. 324.
Acacia pentagona, Hook. f. ! Fl. Nigr. 331.
A. pentaptera, Welw. Apont. Phytogeogr. 584, an distincta ? (*Oliv. l. c.*).
A. pterophylla, Hoffm. Verz. 207, ex DC.
A. prensans, Lowe in Bot. Mag. t. 3408.
A. cæsia, Wall. ! Cat. Herb. Ind. n. 5253 A, non Willd.
A. canescens, Grah. ! in Wall. Cat. Herb. Ind. n. 5256.
A. amblycarpa, Grah. ! in Wall. l. c. n. 5260.
A. philippinarum, Benth. ! in Hook. Lond. Journ. i. 514, quoad Cuming, n. 958.
A. tomentella, Zipp. in Miq. ! Fl. Ind. Bat. i. pars i. 13.
A. paludosa, Miq. Fl. Ind. Bat. i. pars i. 14, ex char.
Inga tenerrima, Jungh. ! MS.
Albizzia tenerrima, De Vries ! Pl. Jungh. i. 270.
Acacia tenerrima, Miq. Fl. Ind. Bat. i. pars i. 14, t. 1 A.

Hab. Tropical and subtropical Asia and tropical Africa.

Like the *A. cæsia*, this widely diffused species is very variable, especially in indumentum. The more pubescent form has often the flower-heads tinged with purple, as represented in the figure quoted from the Botanical Magazine. The glabrous forms, when the leaflets are small, approach the American *A. paniculata*; but the leaflets are not so neat and shining, nor the nerve so marginal as in that species.

429. A. PLURICAPITATA, *Steud. Nom. Bot.* ed. 2. Scandens, tomentosa v. glabrescens. Aculei parvi, recurvi, crebri. Pinnæ 20–25-jugæ; glandulæ parvæ, elevatæ, petiolares et inter pinnas parium plurimorum; foliola ultra 30-juga, anguste linearia, ad 2 lin. longa, glabra v. subtus sericea. Capitula paniculata, parva. Legumen ignotum.—*Benth. ! in Hook. Journ. Bot.* i. 516.

A. polycephala, Grah. ! in Wall. Cat. Herb. Ind. n. 5255, non DC.

Hab. Tropical Asia: Penang, Java, Philippine Islands.

Very near some forms of *A. pennata*, but the pinnæ more numerous; and in all the specimens seen distinguished by the small raised petiolar glands.

430. A. CONCINNA, *DC. ! Prod.* ii. 464. Alte scandens, subarborea, tomentosa v. glabrescens. Aculei recurvi, crebri. Pinnæ 4–8-jugæ; glandulæ verruciformes; foliola 12–30-juga, dimidiato-oblonga v. oblique linearia, obtusa, 3–6 lin. longa. Capitula ad nodos fasciculata pedunculata v. subpaniculato-racemosa. Legumen crasso-carnosum, 3–5-pollicare, ¾–1 poll. latum, vix tardius dehiscens, inter semina linea transversa depressum, et sæpius in articulos monospermos secedens.

Mimosa concinna, Willd. Spec. iv. 1039.
Mimosa rugata, Lam. ! Dict. i. 20.
Acacia rugata, Hamilt. ! in Wall. Cat. Herb. Ind. n. 5251.
Acacia saponaria, Heyne, Herb.
Mimosa abstergens, Roxb. in Spreng. Syst. ii. 207.
Acacia polycephala, DC. Prod. ii. 473.
A. philippinarum, Benth. ! in Hook. Lond. Journ. i. 514, quoad n. 1166 Cumingii.
A. Hooperiana, Zipp. in Miq. ! Fl. Ind. Bat. i. pars i. 10.

Hab. Tropical Asia: Eastern provinces of India and the Archipelago; perhaps also in Mauritius; but Sieber's specimens, n. 252, may possibly have been cultivated.

The peculiar fleshy pod, often articulate, of this species, does not appear to me sufficiently to warrant the establishing it as a distinct genus without any other character, when the habit and foliage so closely resemble those of *A. pennata*, that without the fruit it is sometimes scarcely possible to distinguish them. The inflorescence is less paniculate.

Series 6. Filicinæ.

Frutices inermes, erecti, hirsuti v. glabrati. Pinnæ pluri- v. multijugæ, petiolo communi eglanduloso; foliola multijuga, parvula. Capitula globosa v. ovoidea, summa paniculata, inferiora sæpe axillaria. Flores pedicellati. Stamina alba, nunc pallide fulva v. rosea. Legumen planum, valvis tenuibus, marginibus nerviformibus crassiusculis.

431. A. villosa, *Willd. Spec.* iv. 1067. Villoso-hirsuta v. rarius glabrata. Pinnæ 4–10-jugæ; foliola 12–30-juga, late oblonga, obtusa v. acutiuscula, 2–4 lin. longa. Pedunculi plerique axillares, summi pauci paniculati. Legumen longiuscule stipitatum 1½–2-pollicare, 5–6 lin. latum.

Mimosa villosa, Swartz! Fl. Ind. Occid. ii. 982.
Mimosa arborea, Linn.! Herb. et Spec. 1503, quoad descr., excl. diagn. et syn.
Acacia lophanthoides, DC.! Prod. ii. 457.
A. carbonaria, Schlecht. in Linnæa, xii. 571.
A. Valenzuelana, A. Rich.! Fl Cub. i. 462.
A. Cumingii, Benth.! in Hook. Lond. Journ. i. 525.

Hab. Tropical America: Central America, South Mexico, and West Indies.

The nearly glabrous form upon which I had founded *A. Cumingii* occurs also with the common hirsute form in Jamaica.

432. A. filicina, *Willd. Spec.* iv. 1072. Piloso-hirsuta v. glabrata. Pinnæ 5–20-jugæ; foliola 10–60-juga, linearia v. lineari- oblonga, acuta v. obtusiuscula, 1½–2 rarius fere 3 lin. longa. Capitula pleraque paniculata. Legumen stipitatum, 1–2 rarius 3 poll. longum, 3–5 lin. latum.

Mimosa filicioides, Cav. Ic. i. 55, t. 78.
M. ptericina, Poir. Dict. Suppl. i. 74.
M. angustissima, Mill.! Dict. n. 20.
Acacia penicillifera, Lag. Elench. Hort. Matr. Nov. Gen. et Sp. 16.
A. umbellifera, Kunth! Mim. 100, t. 31.
A. chlorantha, Zucc. in Abhandl. Baier. Acad. Wiss. i. 349, ex char.
A. hirta, Nutt.! et *A. texensis*, Torr. et Gr.! Fl. N. Amer. i. 404.
A. glabrata, *A. elegans*, *A. hirsuta*, *A. cuspidata*, et *A. stipellata*, Schlecht. Linnæa, xii. 569, ad 574.
A. Hartwegi, Benth.! Pl. Hartw. 13.
A. elegans et *A. insignis*, Mart. et Gal.! in Bull. Acad. Brux. x. pars ii. 313.
A. angulosa, Bertol. Fl. Guatem. 42, ex descr.

Hab. Tropical and Northern subtropical America, Mexico, Texas, and Arkansas, Central America, Columbia.

Now that I have had a very large number of specimens before me from a great variety of stations, I find the characters derived from the degree of hairiness, the number of pinnæ and leaflets, upon which the

several species had been distinguished, quite untenable; and however different the glabrous and hirsute forms may appear when exhibited in a few marked specimens, it becomes impossible to define distinct varieties amongst the numerous intermediate ones. The species, abundant as it is in Central America, does not appear to extend into South America beyond the basin of the Magdalena.

XXI. Lysiloma, Benth.

Benth. et Hook. Gen. Pl. i. 595.

This genus, about which I had entertained considerable doubts, has been in a great measure confirmed as more of the fruits have become known. Among all the Ingeæ or Mimoseæ with monadelphous stamens it is the one which comes the nearest to *Acacia*; and the pod at first sight appears to be that which prevails in *Piptadenia*, *Leucæna*, *Acacia*, and *Albizzia*, thin and flat, with thickened more or less nerve-like margins. In those four genera, however, the margins split at maturity, and the whole pod separates into two entire valves, whilst in *Lysiloma* generally the margins remain undivided, as in *Entada* and *Mimosa*, the intermediate thin valves ultimately falling away from them, or perhaps not separating till they rot or irregularly break away. I have now, however, to add a very distinct species, the *Acacia Guachapele* of Kunth, which in every respect connects the American *Lysilomæ* with the Asiatic *Albizziæ*. The umbellate inflorescence, the calyx, corolla, and long stamens are very nearly those of the widely spread *Albizzia Lebbek*; and the foliage, although really distinct, is in many respects so similar, that I had at first thought it might have been an introduced specimen of that species; but the indumentum and form of the leaflets are different; the flowers are, on examination, readily distinguishable, and the pod, as far as I have been able to ascertain, opens partially only along the inner margin, whilst the dorsal margin, thicker than the inner one, remains indivisible, as in all other *Lysilomas*. Almost, if not quite, the whole of the species of this genus have large membranous stipules to the young leaves, which sometimes remain long persistent, although in most fruiting and many flowering specimens they have all, or nearly all, fallen away.

* *Flores umbellati. Leguminis margo interior* (*an semper* ?) *dehiscens.*

1. L. Guachapele, *Benth.* Rufo-tomentella. Pinnæ 3–5-jugæ; foliola 4–6-juga, obovata v. oblongo-subrhombea, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria. Stamina ultrapollicaria.

Acacia Guachapele, H., B. et K. Nov. Gen. et Sp. vi. 281.

Hab. Tropical America: woods near Guayaquil, *Humboldt and Bonpland*; Taboga, near Panama, *Sutton Hayes.*

Arbor 20–30-pedalis v. procera, habitu *Pithecolobii Saman* et *Albizziæ Lebbek*. Ramuli petioli et inflorescentia ferrugineo-tomentosi. Stipulæ a speciminibus delapsæ. Foliorum pinnæ secus petiolum distantes. Glandula in medio petiolo infra jugum inferius pinnarum orbiculata v. scutellata, inter pinnas jugi summi parva, infra foliolorum paria plurima minima. Foliola summa obovata, 1–$1\frac{1}{2}$-pollicaria, cætera irregulariter elliptico-oblonga v. subrhombea sæpiusque minora, omnia obtusissima v. retusa, supra demum glabrata, subtus adpresse pubescentia. Pedunculi axillares, 1–$1\frac{1}{2}$-pollicares. Umbellæ receptaculum subglobosum. Bracteas non vidi. Flores ultra 20. Pedicelli 3–4 lin. longi, uti calyces et corolla pube rufescente tomentosi. Calyx anguste campanulatus, $1\frac{1}{2}$ lin. longus. Corolla infundibularis, 3–4-linearis, limbo latiusculo. Stamina 15–20, fere $1\frac{1}{2}$ poll. longa, basi in tubum brevem corollæ ima basi adnatum coalita. Legumen 6–10 poll. longum, $1\frac{1}{4}$–$1\frac{1}{2}$ poll. latum, rufo-puberulum, marginibus nerviformi-incrassatis, interiore demum fisso, dorsali crassiore indiviso, valvis planis tenuissimis demum deliquescentibus v. partim dehiscentibus.

** *Flores globoso-capitati. Leguminis margo undique indivisus.*

2. L. TERGEMINA, *Benth.*, sp. n. Glabra. Pinnæ unijugæ; foliola sesquijuga, oblique obovata v. oblonga, ultrapollicaria, obtusissima.

Hab. Tropical America: Mexico, Puebla district, *Andrieux*, n. 403. Also in Pavon's collection, marked "*Mimosa carnosa*, del Peru," but probably a misplaced label, and the plant really from Moçino and Sessé's Mexican collection.

Frutex v. arbor, ramulis teretiusculis, cortice albido, primo intuitu stipulis delapsis *Calliandram tergeminam* referens. Stipulæ orbiculatæ, basi cordatæ, obtusissimæ v. acutiusculæ, sæpe semipollicem excedentes, per anthesin interdum persistentes, a specimine fructifero jam delapsæ. Foliorum petiolus communis et pinnarum rhachis raro semipollicem excedunt. Glandula umbonata inter pinnas, et inter foliola terminalia. Foliorum majorum foliola terminalia 2–3 poll. longa, 1–1½ poll. lata, obtusissima v. rarius hinc inde acutiuscula, basi dimidiato-semicordata, rigide membranacea, pennivenia et reticulato-venulosa, laterale cujusve pinnæ multo minus et minus inæquale, et in aliis speciminibus foliola omnia vix pollicem excedunt. Pedunculi axillares, graciles, 1–1½-pollicares. Capitula dense multiflora. Bracteolæ parvæ, lineares, subspathulatæ. Flores glabri. Calyx membranaceus, 5-fidus, 1¼ lin. longus. Corolla 5-fida, membranacea, 2 lin. longa. Stamina ad 30, corolla plus triplo longiora, filamentis tenuissimis, in tubum corolla breviorem connatis. Legumen stipitatum, glaberrimum, glaucum, ad 5 poll. longum, 1½ poll. latum, margine nerviformi persistente, valvis membranaceis circa semina diu cohærentibus a margine demum solutis.

3. L. SABICU, *Benth.! in Hook. Kew Journ.* vi. 236. Glabra. Petioli tenues; pinnæ dissite 2–3-jugæ; foliola laxe 4–5-juga, oblique obovalia v. late oblonga, obtusissima, subsemipollicaria. Legumen 4–6-pollicare, 1½ poll. latum.

Acacia formosa, A. Rich.! Fl. Cub. i. 463 non Kunth.

Leucæna formosa, Griseb.! Cat. Pl. Cub. 82.

Hab. Tropical America: Cuba, *Ramon de la Sagra*, *Wright*, n. 2392.

4. L. LATISILIQUA, *Benth.* Glabra v. vix pilosula. Pinnæ 2–4-jugæ; foliola 10–20-juga, oblique ovata v. oblonga, obtusa, 3–6 lin. longa.

Mimosa latisiliqua, Linn. Spec. 1504, ad ic. Plum. ed. Burm. t. 6.

Acacia latisiliqua, Willd. Spec. iv. 1067.

Lysiloma bahamensis, Benth.! in Hook. Lond. Journ. iii. 82.

Acacia bahamensis, Griseb.! Fl. Brit. W. Ind. 221.

Hab. Tropical and subtropical N. America: "American islands" (*Plumier*), Bahamas, *Swainson*; Key West, Florida, *Rügel*, n. 212; and apparently the same species, Caraccas, *Bredemeyer*.

Rami verrucosi, ramuli folia et inflorescentia glabra v. vix pilosula siccitate nigrescunt. Stipulæ semipollicares, foliaceæ, ovatæ, acutæ, basi hinc late semicordato-auriculatæ, interdum in speciminibus floridis persistentes, sæpius caducæ. Foliorum petiolus communis 2–3-pollicaris, pinnarum rhaches sæpe longiores. Glandula elevata, crassiuscula, infra pinnarum par infimum, ad paria superiora raræ. Foliola 3–6 lin. longa, 2–3 lin. lata, basi obliqua, cæterum vix inæquilatera, costa parum excentrica, additis interdum venis 1–2 lateralibus brevibus. Pedunculi ¾–1½ poll. longi, solitarii v. fasciculati, in axillis superioribus v. in racemum brevem terminalem dispositi. Capitula dense globosa, absque staminibus 3–4 lin. diametro, ante anthesin canescentia. Calyx lineam longus, membranaceus, late 5-dentatus. Corolla paullo longior, semi-5-fida. Stamina ad 20, corolla duplo longiora, tubo corolla dimidio breviore. Legumen ex icone Plumeriana longe stipitatum, semipedale, 1½ poll. latum.

Plumier's figure and description, upon which Linnæus established the species, leave no doubt as to the

identity of his plant with the one above described. The specimen, however, in the Linnæan herbarium from the Upsala garden, named *Mimosa latisiliqua*, is evidently the common *Leucæna glauca*; and in other old herbaria I have found *Mimosa* or *Acacia latisiliqua* represented by *Leucæna trichodes*, or *Albizzia Julibrissin*.

5. L. POLYPHYLLA, *Benth.* Glabra v. minute puberula. Pinnæ 3–8-jugæ; foliola multijuga, linearia, inæquilatera, mucronulata, ad 3 lin. longa, puberula, costa valde excentrica v. fere marginali.

Acacia polyphylla, Clos! in C. Gay, Fl. Chil. ii. 254.

Hab. Subtropical South America: Chivesivi valley, south of La Paz, in Bolivia, at an elevation of 8500 to 10,000 feet, *Pentland*. Cultivated in the province of Coquimbo, probably from Tucuman, *C. Gay*.

Valde affinis *L. Schiedeanæ*, foliorum forma et venatio parum diversæ. Stipulæ a speciminibus jam delapsæ. Glandulæ parvæ, raræ. Pedunculi 1–1½-pollicares, fasciculati. Capitula densa, canescentia, omnino *L. Schiedeanæ*. Calyx membranaceus, lineam longus. Corolla duplo longior, apice breviter 4-fida. Stamina fere 50, semipollicaria, tubo corolla parum breviore et ab hac a basi libero. Legumen omnino *L. Schiedeanæ*.

6. L. SCHIEDEANA, *Benth.! in Hook. Lond. Journ.* iii. 83; *Bot. Sulph.* 91, t. 31, Glabra v. minute puberula. Pinnæ 6–8-jugæ; foliola multijuga, linearia, ad 3 lin. longa, glabra, costa subcentrali. Legumen 4–6-pollicare, 6–8 lin. latum.

Acaciæ species incerta sexta, Schiede in Linnæa, v. 596, xii. 573.

Mimosa divaricata, Jacq. Hort. Schœnbr. iii. 76, t. 395, ex ic. et descr.

Acacia divaricata, Willd. Spec. iv. 1070.

Hab. Tropical America: near Tampico, *Schiede*; Central America, *Sinclair*; island of San Lucas, *Œrsted*.

7. L. AURITA, *Benth.! in Hook. Lond. Journ.* iii. 83. Ramuli petioli et pedunculi tomentelli. Pinnæ 20–25-jugæ; foliola multijuga, linearia, ciliolata, vix sesquilinearia. Legumen 4–6-pollicare, pollicem latum.

Acacia aurita, Schlecht.! in Linnæa, xii. 572.

Hab. Tropical America: "Malpays de Naulingo," in Mexico, *Schiede*; Guatemala, *Skinner*; Segovia, *Œrsted*.

Leguminis valvæ tenues, rigidulæ, glabræ, demum ut videtur a marginibus indivisis solvendæ.

The above description of the pod is taken from Œrsted's fruiting specimens, which, although the large stipules are already fallen away, appear to belong to the same species.

8. L. MICROPHYLLA, *Benth.! in Hook. Lond. Journ.* iii. 83. Pubescens. Stipulæ lanceolatæ, pubescentes, quam in præcedentibus multo angustiores. Pinnæ 5–8-jugæ; foliola multijuga, 1–2-linearia, subtus puberula.

Acacia arborea, Benth.! Pl. Hartw. 13, non Willd.

Hab. Tropical America: Leon in Mexico, *Hartweg*; Cape S. Lucas, Lower California, *Xantus*, n. 30.

Habitus fere *Pithecolobii parvifolii*. Flores valde diversi. Legumen breviter stipitatum, 3–4 poll. longum, 5–8 lin. latum, glabrum, læve, valvis tenuiter membranaceis a margine nerviformi indiviso persistente secedentibus.

*** *Flores cylindraceo-spicati. Leguminis margo indivisus.*

9. L. ACAPULCENSIS, *Benth.! in Hook. Lond. Journ.* iii. 83. Pubescens. (Stipulæ parvæ ?) Pinnæ 7–12-jugæ; foliola multijuga, oblongo-linearia, 2–3 lin. longa, pilosula, costa subcentrali. Legumen semipedale, $1\frac{1}{2}$ poll. latum.

Acacia acapulcensis, Kunth! Mim. 78, t. 24.

A. desmostachya, Benth.! Pl. Hartw. 13.

Lysiloma desmostachya, Benth. in Hook. Lond. Journ. iii. 84.

Hab. Tropical America: Mexico, near Acapulco, *Humboldt and Bonpland*; near Leon, *Hartweg*, n, 75; Volcan de Santa Barbara, *Berlandier*, n. 3144.

Petiolorum glandula in specimine Bonplandiano minus elevata quam in Hartwegianis et Berlandierianis, cæterum conveniunt. Foliola in omnibus adpresse pilosula. Stamina ad 30, etiam in specimine Bonplandiano corolla subtriplo longiora. Leguminis margo solutus latiusculus.

10. L. ROSTRATA, *Benth.! in Hook. Lond. Journ.* iii. 84. Scandens, glabra. Stipulæ orbiculatæ, 1–$1\frac{1}{2}$ lin. latæ. Pinnæ 6–8-jugæ. Foliola multijuga, oblongo-linearia, costa submarginali.

Acacia rostrata, Humb. et Bonpl. in Willd. Spec. iv. 1060.

Mimosa rostrata, Poir. Dict. Suppl. i. 66.

Mimosa ignava, H., B. et K.! Nov. Gen. et Sp. vi. 259.

Hab. Tropical America: New Granada, on the banks of the Magdalena, *Humboldt and Bonpland.*

Stipulæ ad innovationes persistentes, rigidulæ, striatæ, a ramis foliatis delapsæ. Foliola glaberrima, acuta. Spicæ ad axillas fasciculatæ. Stamina plurima, basi monadelpha. Legumen 3–4 poll. longum, 6 lin. latum, planum, coriaceum, valvis in articulos 12–15 plus minus distincte a margine nerviformi persistente secedentibus.

An anomalous species, with the pod almost of a *Mimosa,* but which on an inspection of the original specimen at Paris (in fruit only, with remains of flowers), as well as from Kunth's description, appeared to me to be an undoubted *Lysiloma,* with indefinite rather numerous monadelphous stamens. The transverse breaking up of the valves at maturity, exceptional in this genus as in a few species of *Pithecolobium* and *Acacia,* is not constant in *Mimosa.*

XXII. CALLIANDRA, Benth.

Benth. et Hook. Gen. Pl. i. 596.

The heteromorphous flowers which occur in the centre of the flower-head of many species of this genus, and sometimes in a few species of *Pithecolobium,* appear in a few instances to be the result of insect puncture. In many cases, however, they must be constitutional and uninjured; for they are then even more fertile than the normal ones. I have found no albumen in any of the seeds I have examined; the radicle is entirely enclosed within the cotyledons, which are often attached far above the base, and sometimes (in *C. Harrisii*) borne on minute stalks or petioles.

The genus is a natural one, and I have been unable to divide it into distinct sections; those proposed by Grisebach have proved untenable when applied to the species of continental South America. The following series are founded chiefly on foliage and inflorescence:—

Series 1. MACROPHYLLÆ. Pinnæ unijugæ. Foliola 1–3-juga, paris terminalis $1\frac{1}{2}$–8-pollicaria. Flores sessiles.—Species 1–21.

Series 2. LÆTEVIRENTES. Pinnæ bi- v. plurijugæ. Foliola pluri-, sæpius multijuga, infrapollicaria, membranacea. Flores sessiles.—Species 22–33.

Series 3. PEDICELLATÆ. Pinnæ 1–2-jugæ. Foliola pluri- v. multijuga. Flores in umbellulis longiuscule pedicellati. Corolla membranacea.—Species 34–37.

Series 4. NITIDÆ. Pinnæ uni- v. plurijugæ. Foliola pluri-, sæpius multijuga, parva, rarius semipollicaria, sæpius nitida. Flores sessiles, rarius breviter pedicellati. Corolla sæpius striata.—Species 38–95.

Series 5. RACEMOSÆ. Pinnæ multijugæ. Foliola multijuga, parva. Capitula pauciflora, longe racemosa v. thyrsoideo-paniculata.—Species 96-100.

Glandulæ petiolares adsunt in speciebus 2 Brasiliensibus *Lætevirentium* et in speciebus 2 Gerontogeis *Nitidarum*.

Stipulæ spinescentes in speciebus 2 Gerontogeis et 1 Andina *Macrophyllarum*, in specie 1 *Pedicellatarum* et in speciebus 3 Americanis et 1 Asiatica *Nitidarum*.

Spicæ oblongæ v. cylindraceæ in specie 1 Madagascariensi.

Series 1. MACROPHYLLÆ.

Pinnæ $\frac{1}{2}$–1-jugæ. Foliola 1–$1\frac{1}{2}$-juga, rarius 2–6-juga, coriacea v. rigidule chartacea, terminalia sæpius pollicem excedentia et interdum 6–8-pollicaria. Pedunculi, excepta *C. amazonica*, ad axillas v. ad nodos vetustos solitarii fasciculati v. breviter racemosi. Flores in capitulo sessiles, glabri v. rarius pubescentes. Calyx, excepta *C. amazonica*, breviter dentatus. Legumen, excepta *C. mollissima*, glabrum.

* Bifoliolatæ. *Foliola in toto folio* 2, *ad apicem petioli articulata.*

1. C. CYNOMETROIDES, *Bedd.! Fl. Sylv.* t. 317. Glabra. Stipulæ spinescentes v. obsoletæ. Foliola elliptica, sæpe obliqua, pennivenia, 3–4-pollicaria. Pedunculi tenues. Calyx minimus. Corolla trifida. Legumen leviter falcatum, 4–5-pollicare, 6–8 lin. latum, valvis rigide coriaceis intra margines incrassatos transverse reticulatis.

Hab. Tropical Asia : East-Indian peninsula, mountains of Tinnivelly and Travancore, *Beddome*.

2. C. HYMENÆOIDES, *Benth.* Glabra. Stipulæ parvæ, innocuæ. Foliola falcato-ovata, obtuse acuminata, $1\frac{1}{2}$–$2\frac{1}{2}$-pollicaria, nitida, 2–3-nervia. Pedunculi tenues. Calyx 1 lin., corolla ad 4 lin. longa. Legumen lignosum, 2–3-pollicare. 4–5 lin. latum, valvis inter margines latos elevatos venosis.

Inga hymenæoides, Desv.! Journ. Bot. 1814, i. 70; DC.! Prod. ii. 436.

Mimosa hymenæodes, Pers. Syn. ii. 262.

Hab. Tropical America : Cayenne.

In this species the leaf appeared to be reduced to a single pinna, the petiole articulate on an exceedingly short common petiole, the other pinna deficient. In *C. cynometroides* I can see no articulation at the base of the petiole.

** Unijugæ. *Foliola in utraque pinna* 1-*juga, addito sæpius foliolo tertio inferiore minore.*

3. C. GRIFFITHII, *Baker! in Hook. Fl. Ind.* ii. *ined.* Glabra, foliosa. Pinnæ 1-jugæ, petiolo brevi tenui; foliola 1-juga, lanceolata v. oblongo-lanceolata, acute acuminata, tenuiter coriacea, nitida, $1\frac{1}{2}$–$2\frac{1}{2}$-pollicaria, addito sæpius tertio minore. Pedunculi filiformes, 1–$1\frac{1}{2}$-pollicares. Flores sessiles, tenues, glabri. Calyx 1 lin., corolla 4–5 lin. longa. Legumen ignotum.

Hab. Subtropical Asia : Khasia, *Griffith.*

4. C. UMBROSA, *Benth.! in Benth. et Hook. Gen. Pl.* i. 597. Glabra. Stipulæ spines-

centes v. obsoletæ. Pinnæ 1-jugæ; foliola unijuga, ovali-oblonga, acuminata, parum obliqua, pennivenia, 4–6-pollicaria v. in ramis sterilibus duplo majora, addito sæpe tertio minore. Pedunculi breves. Calyx vix lineam, corolla 4 lin. longa. Stamina albida, tubo vix exserto. Legumen leviter falcatum, 4–6-pollicare, 8–10 lin. latum, valvis inter margines elevatos rigide coriaceis transverse reticulatis.

Inga umbrosa, Wall.! Pl. As. Rar. ii. 23, t. 124.
Albizzia umbrosa, Benth. in Hook. Journ. Bot. iii. 86.

Hab. Subtropical Asia: Silhet, *Wallich, J. D. Hooker.*

5. C. AMAZONICA, *Benth.! in Hook. Lond. Journ.* iii. 94. Glabra. Pinnæ 1-jugæ; foliola 1-juga, falcato-ovata, obtuse acuminata, 4–7-pollicaria, elevato- 2–3-nervia, addito rarissime tertio minore. Panicula laxissime divaricata, pedunculis ad nodos distantes fasciculatis. Calyx 5-fidus $\frac{3}{4}$ lin., corolla membranacea $2\frac{1}{2}$ lin. longa. Legumen tenuiter coriaceum, 8-pollicare, 4–5 lin. latum.—*Fl. Bras. Mim.*

Inga bauhiniæfolia, Pœpp. et Endl.! Nov. Gen. et Sp. iii. 80, t. 290.

Hab. Tropical America: Amazonian district of Peru.

6. C. TRINERVIA, *Benth.! in Hook. Lond. Journ.* iii. 94. Glabra. Pinnæ 1-jugæ; foliola 1-juga, falcato-ovata, obtuse acuminata, 3–6-pollicaria, elevato-2–3-nervia, addito sæpissime tertio minore. Pedunculi axillares. Calyx breviter dentatus $\frac{1}{2}$ lin., corolla $3\frac{1}{2}$ lin. longa, striata. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil and Venezuela, along the Rio Negro.

7. C. BOMBYCINA, *Spruce!* sp. n. Glabra. Pinnæ 1-jugæ; foliola sæpius 2-juga, falcato-ovata, obtuse acuminata, 3-nervia, terminalia sub-4-pollicaria. Pedunculi subfasciculati. Calyx $1\frac{1}{2}$ lin., corolla ad 6 lin. longa. Legumen coriaceum, 4–5-pollicare, 4–5 lin. latum.

Hab. Tropical America: Eastern Peru on the Huallaga, where the rich-coloured silky flower-heads are much used as ornaments for the hair, *Spruce* n. 4235,

Arbor fide Sprucei 18-pedalis, habitu et foliis fere *C. trinerviæ,* floribus duplo majoribus statim dignoscenda. Foliolorum par infimum sæpius adest perfectum, exteriore $1\frac{1}{2}$–2-pollicare, interiore multo minore, interdum ut in *C. trinervia* deficiente. Stipulæ late ovatæ, obtusæ, rigidæ, striatæ. Pedunculi $\frac{1}{2}$–1-pollicares, nunc ad nodos fasciculati, nunc in ramo brevi aphyllo dissiti, basi bracteis stipulaceis cincti. Corollæ rigidulæ, striatæ. Stamina bipollicaria et longiora, tubo incluso v. vix exserto. Legumen rectum v. leviter curvum, læve, more generis basin versus longe contractum, marginibus valde incrassatis.

8. C. CARBONARIA, *Benth.! in Hook. Lond. Journ.* iii. 95. Glabra. Pinnæ 1-jugæ; foliola 1-juga, falcato-oblonga, obtuse acuminata, elevato-2–3-nervia, 3–5-pollicaria, addito interdum tertio minore. Pedunculi subfasciculati. Calyx $1\frac{1}{2}$ lin., corolla 4–$4\frac{1}{2}$ lin. longa. Staminum tubus longe exsertus. Legumen pollicare, 7–8 lin. latum.

Hab. Tropical America: Andes of Quito, *Jameson*; prov. Popayan, *Hartweg*, n. 964; also apparently the same on Mount Aguacate in Central America, *Œrsted.*

9. C. LONGIPES, *Benth.! in Mart. Fl. Bras. Mim.* Humilis, glabra. Pinnæ 1-jugæ; foliola 1-juga, oblique obovato-oblonga, 2–3-pollicaria, coriacea, costa valida, nervis

1–2 tenuioribus, addito tertio minore. Pedunculi subradicales, 6–8-pollicares. Calyx 1 lin., corolla ad 5 lin. longa. Legumen junius jam 3-pollicare, 4 lin. latum.

Hab. Tropical America: Brazil, prov. Goyaz.

10. C. EMARGINATA, *Benth.! in Hook. Lond. Journ.* iii. 95. Glabra. Pinnæ 1-jugæ; foliola 1-juga, oblique obovato-oblonga, obtusa v. breviter acuminata, $1\frac{1}{2}$–$2\frac{1}{2}$-pollicaria, tenuiter coriacea, sub-3-nervia, reticulata, nitidula, addito tertio minore. Pedunculi ad nodos fasciculati v. breviter racemosi. Calyx linea brevior. Corolla vix 3 lin. longa. Legumen haud crassum, glabrum, 3–4-pollicare, $\frac{1}{2}$ poll. latum.

Inga emarginata, Humb. et Bonpl. in Willd. Spec. iv. 1009; Kunth! Mim. t. 17.
Inga coriacea, Humb. et Bonpl. in Willd.! Spec. iv. 1010.
Mimosa emarginata et *M. coriacea,* Poir. Dict. Suppl. i. 39.
Calliandra coriacea, Benth. in Hook. Lond. Journ. iii 95.

Hab. Tropical America: Mexico near Acapulco, *Humboldt and Bonpland*; near Consaquitla, *Liebmann*; New Spain, *Herb. Pavon.*

11. C. GLYPHOXYLON, *Spruce!*, sp. n. Glabra v. pilosula. Pinnæ 1-jugæ; foliola subfalcata, ovato-oblonga, obtusa v. breviter acuminata, elevato-2–3-nervia, $1\frac{1}{2}$–$2\frac{1}{2}$-pollicaria, addito tertio minore. Pedunculi $\frac{1}{2}$–1-pollicares. Calyx vix lineam longus. Corolla 3–$3\frac{1}{2}$ lin. Legumen rigide coriaceum, 3–4-pollicare, 3–6 lin. latum, valvis venosis.

Hab. Tropical America: Pallatanga in Ecuador, called by the Quitonians "Palo de las siete vueltas," because the branches are traversed under the bark by seven or more slightly spiral striæ, *Spruce*, n. 5571.

Arbor ramosa, 20-pedalis, pilis paucis præsertim in rhachibus foliorum et partibus novellis sæpius conspersa. Stipulæ lanceolato-subulatæ, parvæ. Foliorum petiolus communis in forma typica 2–3 lin. longus, pinnarum rhaches duplo longiores. Stipellæ brevissimæ v. obsoletæ. Stamina alba v. rosea in eadem planta (*Spruce*), tubo vix exserto. Leguminis forma omnino generis.

Var. GLABERRIMA, foliorum petiolo communi sæpe $\frac{1}{2}$–1-pollicari, rhachibus pinnarum brevioribus, foliolis angustioribus.—Valley of the Magdalena, *Triana.*

12. C. ANGUSTIFOLIA, *Spruce!*, sp. n. Glabra. Pinnæ 1-jugæ; foliola 1-juga, anguste oblonga, valde obliqua, 1–$1\frac{1}{2}$-pollicaria, coriacea, nitidula, sub-2-nervia, addito tertio multo minore. Pedunculi 2–4 lin. longi. Calyx 1 lin., corolla fere 3 lin. longa. Legumen sublignosum, 3-pollicare, 3–4 lin. latum, marginibus valde incrassatis, valvis vix venosis.

Hab. Tropical America: Eastern Peru, very abundant on the banks of the Huallaga and the Mayo rivers, *Spruce*, n. 4466.

Arbor 15–20-pedalis, patule ramosa, ramis longis rigidis. Stipulæ breves, rigidæ, acutissimæ. Folia conferta, foliolis quam in omnibus affinibus multo angustioribus. Pedunculi rigiduli. Leguminis margines valde incrassati.

13. C. TERGEMINA, *Benth.! in Hook. Lond. Journ.* iii. 96. Glabra. Pinnæ 1-jugæ; foliola 1-juga, oblique obovali-oblonga, obtusa, tenuiter coriacea, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria, addito tertio minore. Pedunculi subfiliformes. Calyx vix $\frac{1}{2}$ lin., corolla 3–$3\frac{1}{2}$ lin. longa. Legumen 3–4-pollicare, 3–$3\frac{1}{2}$ lin. latum, valvis inter margines incrassatos tenuibus.

Mimosa tergemina, Linn. Spec. 1499.
Inga tergemina, Willd. Spec. iv. 1008.

Inga caripensis, Humb. et Bonpl. in Willd. Spec. iv. 1009.
Mimosa caripensis, Poir. Dict. Suppl. i. 39.

Hab. Tropical America: West Indies; Trinidad, St. Vincent's, Martinique, Dominica, St. Lucia, etc.; Venezuela, Caripe near Cumana, *Humboldt and Bonpland*, Puerto Cabello, *Karsten.*

14. C. Seemanni, *Benth.! in Seem. Bot. Her.* 116, t. 22. Glabra v. tenuissime puberula. Pinnæ 1-jugæ; foliola 1-juga, oblique oblonga, obtusa v. acutiuscula, tenuiter coriacea, $\frac{3}{4}$–1-pollicaria, addito tertio minore. Pedunculi subfiliformes. Calyx $1\frac{1}{2}$ lin., corolla 3 lin. longa. Legumen 3–4-pollicare, ad 4 lin. latum, valvis inter margines incrassatos tenuibus.

Inga semicordata, Bertol. Fl. Guatem. 41? ex descr.

Hab. Tropical America: Veragua, *Seemann*; Cumana, *Funcke*, n. 569; between Valencia and San Estevan, *Fendler*, n. 2253.

This species closely resembles *C. tergemina*; but the calyx, half instead of only one sixth the length of the corolla, appears to be constant.

15. C. Harrisii, *Benth.! in Hook. Lond. Journ.* iii. 95. Molliter pubescens v. glabra, Pinnæ 1–jugæ; foliola 1–juga, oblique obovali-oblonga, subfalcata, obtusa, uninervia v. inæqualiter 2–3-nervia, reticulato-pennivenia, bipollicaria, addito tertio minore. Pedunculi axillares, breves. Calyx $1\frac{1}{4}$ lin., corolla 4 lin. longa. Legumen sub-4-pollicare, valvis crassis lignoso-suberosis subteres, marginibus haud incrassatis, more generis tamen basin versus attenuatum, valvis dehiscentia elastice revolutis.—*Fl. Bras. Mim.*

Inga Harrisii, Lindl.! Bot. Reg. 1839, t. 41; Bot. Mag. t. 4238.
Calliandra cylindrocarpa, Benth. in Hook. Lond. Journ. iii. 96.
Clelia ornata, Casar. Nov. Stirp. Dec. 84.

Hab. Brazil, prov. Rio Janeiro.

The foliage is that of *C. tergemina.* The *I. Harrisii,* Lindl., was said to be from Mexico. The specimens differed from those I formerly possessed of the Brazilian *C. cylindrocarpa* in their pubescence; and I had not seen the fruit; so I concluded the two were distinct. I have, however, since seen the fruit of the garden *I. Harrisii,* which is precisely that of the *C. cylindrocarpa*; and among the numerous Rio Janeiro specimens in the various herbaria I have now had before me, many pubescent ones, often mixed with the glabrous ones, agree so precisely with the garden ones, that I feel obliged to conclude that all belong to one species, introduced from Rio Janeiro, and not from Mexico. The fruit is peculiar in the genus.

16. C. canescens, *Benth.! in Hook. Lond. Journ.* iii. 96. Molliter pubescens. Pinnæ 1-jugæ; foliola 1-, rarius 2-juga, terminalia, oblique obovali-oblonga, obtusa, 1-nervia, reticulato-venosa, $\frac{3}{4}$ poll. longa, tertio minore, quarto minimo v. deficiente. Pedunculi rigiduli, 1–2-pollicares. Flores villosi. Calyx 2 lin., corolla 4 lin. longa. Legumen ignotum.

Inga canescens, Cham. et Schlecht.! in Linnæa, v. 592.

Hab. Tropical America: Mexico, *Schiede* (Herb. Berol.).

*** *Foliola perfecte* 2–6-*juga, addito interdum foliolo infimo solitario.*

17. C. subnervosa, *Benth. in Herb. Boiss.* sp. n. Pilosula. Pinnæ 1-jugæ; foliola 2-juga, terminalia, dimidiato-oblonga, nitidula, 2–3-nervia, 1–$1\frac{1}{2}$-pollicaria. Pedunculi

breves. Calyx linea longior. Corolla 3-linearis membranacea. Legumen 2–3-pollicare, crassum, sublignosum, glabrum.

Mimosa subnervosa, Pavon, in Herb. Boiss.

Hab. Tropical America: Guayaquil, *Tafalla.*

Species *C. tergeminæ* affinis, sed foliolorum jugo inferiore perfecto, pinnis stipellatis aliisque notis distincta. Ramuli divaricati, striati, pilis brevibus plus minus pubescentes. Stipulæ persistentes striatæ, e basi lata longe acuminatæ, 2–5-lineares. Foliorum petiolus communis ½–1-pollicaris; pinnarum rhaches breviores, basi stipella lato-lanceolata acuta 1–2 lin. longa stipatæ. Foliola margine ciliata, inferiora terminalibus multo minora. Flores in capitulo haud numerosi, glabri.

18. C. Guildingii, *Benth.! in Hook. Lond. Journ.* iii. 96. Glaberrima. Pinnæ 1-jugæ; foliola 2–3-juga, terminalia oblique ovata, obtuse acuminata, 1½-pollicaria, sub-3-nervia, nitida, inferiora rhomboidea, interioribus minoribus. Pedunculi 1½–2-pollicares. Calyx 1½-linearis, striatus. Corolla 5 lin. longa, vix striata. Legumen leviter falcatum, lignosum, 4–5-pollicare.—*Griseb.! Fl. Brit. W. Ind.* 225.

Hab. Tropical America: Trinidad and St. Vincent's.

19. C. falcata, *Benth.! in Hook. Lond. Journ.* iii. 97. Molliter rufo-villosa. Pinnæ 1-jugæ; foliola 3–4-juga, terminalia falcato-semiovata, obtuse acuminata, 2–3-nervia, 2–3-pollicaria, nitidula, pubescentia, inferiora minora. Pedunculi 1½-pollicares. Flores pubescentes. Calyx ¾ lin., corolla 3 lin. longa. Legumen rufo-pubescens v. glabratum, sublignosum, 2–2½-pollicare, 4–5 lin. latum.

Hab. Tropical America: Venezuela, near Caraccas, *Birschell, Fendler* n. 352, *Funcke* n. 370.

20. C. mollissima, *Benth.! in Hook. Lond. Journ.* iii. 97. Flavescenti- v. sericeo-villosa. Pinnæ 1-jugæ; foliola sub-4-juga, oblique obovata, 2-nervia, terminalia 1–1¼-pollicaria. Pedunculi 1–2-pollicares. Flores glabriusculi. Corolla calyce quadruplo longior. Legumen lignosum, tomentoso-villosum, 3–4-pollicare, ad 5 lin. latum.

Inga mollissima, Humb. et Bonpl.! in Willd. Spec. iv. 1023, Kunth! Mim. t. 19.

Mimosa mollissima, Poir. Dict. Suppl. i. 46.

Hab. Tropical America: North Peru, prov. Jean de Bracamoras, near Guerocotillo, between the Amazon and the Choto, *Humboldt and Bonpland.*

21. C. aculeata, *Spruce,* sp. n. Glabra v. vix hinc inde pilosula. Stipulæ breves, sæpe spinescentes. Pinnæ 1-jugæ; foliola 5–6-juga, oblique ovato-lanceolata v. oblonga, acuta v. rarius obtusa, terminalia 1–2-pollicaria, 1–2-nervia, nitidula. Pedunculi 2-pollicares. Calyx vix lineam longus. Corolla membranacea, 2½ lin. longa. Legumen 4–5-pollicare, 4 lin. latum, glabrum, valvis inter margines incrassatos tenuibus.

Hab. Tropical America: Ecuador, at the foot of Mount Tunguragua, *Spruce,* n. 5054.

Arbor 30-pedalis. Stipulæ breves, rigidæ, lineari-lanceolatæ v. conicæ, apice sæpius pungentes. Foliorum petiolus communis subsemipollicaris, pinnarum rhaches 2–5-pollicares, tenues. Foliola inferiora terminalibus paullo minora, paris infimi adhuc minora, interiore sæpe deficiente v. minimo. Calyx breviter dentatus. Stamina rosea, tubo vix exserto.

(See also 55. *C. hæmatocephala,* which approaches the *Macrophyllæ* in foliage.)

Series 2. Lætevirentes.

Pinnæ 2- v. pluri-jugæ. Foliola pluri- v. multijuga, parva v. rarius subpollicaria, membranacea, lætevirentia. Pedunculi ad axillas v. ad nodos vetustos solitarii fasciculati v. breviter racemosi. Flores sessiles. Calyx ad medium v. profunde 5-fidus. Corolla membranacea. Filamenta alba v. rosea, rarius intensius colorata.

22. C. capillata, *Benth. ! in Hook. Lond. Journ.* iii. 98. Glabra. Pinnæ 2–3-jugæ; foliola 3–4-juga, valde obliqua, obovato-elliptica, terminalia sæpe pollicem excedentia. Pedunculi tenues. Calyx 1 lin., corolla $2\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. Tropical America: Mexico, foot of Mount San Felipe, *Andrieux*, n. 404.

23. C. formosa, *Benth. ! in Hook. Lond. Journ.* iii. 98. Glabra. Pinnæ 2–3-jugæ; foliola 4–8-juga, obovali-elliptica, valde obliqua, 6–9 lin. longa. Pedunculi tenues. Calyx 1 lin., corolla 2 lin. longa. Legumen *C. portoricensis*, 2–3-pollicare, 3–4 lin. latum.—*Fl. Bras. Mim.*

Acacia formosa, Kunth ! Mim. 102. t. 32.
Calliandra viridiflora, Benth. in Hook. Lond. Journ. iii. 98.
Acacia gracilis, Mart. et Gal. ! in Bull. Acad. Brux. x. ii. 311.
Calliandra gracilis, Griseb. ! in Mem. Amer. Acad. viii. 180, pro parte.
C. marginata, Griseb. ! in Herb. Hook.

Hab. Tropical America: Cuba, Mexico, and, apparently the same species, Bolivia, *Bridges*; Mattogrosso and Paraguay, *Weddell*; Sant' Iago del Estero, *Tweedie*.

The species is closely allied to *C. portoricensis*, distinguished chiefly by the fewer, larger, broader leaflets.

24. C. gracilis, *Klotzsch ! Herb.*; *Baker ! in Saund. Refug. Bot.* t. 294. Pubescens. Pinnæ 2–3-jugæ; foliola 4–6-juga, obovata v. late oblonga, valde obliqua, terminalia ad $\frac{3}{4}$ poll. longa, subtus molliter pubescentia. Pedunculi tenues. Calyx $\frac{3}{4}$ lin., corolla $1\frac{1}{2}$ lin. longa. Stamina alba. Legumen *C. portoricensis*, 2–3-pollicare, 3–4 lin. latum.

Hab. Tropical America: Venezuela, near La Guayra, *Fendler*, n. 358, *Otto*, n. 404, *Moritz*, n. 887.

Differs from *C. formosa* chiefly in the pubescence.

25. C. scutellifera, *Benth. ! in Hook. Journ. Bot.* ii. 139; *Lond. Journ.* iii. 98. Glabra v. leviter puberula. Pinnæ 2–3-jugæ; glandula scutellata ad basin petioli, parvæque inter pinnas; foliola 6–9-juga, obovato-oblonga, terminalia 6–8 lin. longa. Corolla $1\frac{1}{2}$ lin. longa. Stamina rubra, basi alba. Legumen *C. portoricensis*, 3–4-pollicare.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Negro and Goyaz.

Distinguished from the preceding chiefly by the petiolar glands.

26. C. filipes, *Benth. ! in Hook. Journ. Bot.* ii. 139; *Lond. Journ.* iii. 99. Puberula. Pinnæ 3–4-jugæ; glandulæ in petiolo et inter pinnas parvæ; foliola 10–16-juga, dimidiato-oblonga, 4–6 lin. longa. Pedunculi tenues. Corolla 2 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes or Goyaz.

Closely allied to *C. portoricensis*, but more slender, and the glands appear to be constant.

27. C. LAMBERTIANA, *Benth.! in Hook. Lond. Journ.* iii. 100. Villosula. Pinnæ 2–3- rarius 4-jugæ; petiolus eglandulosus; foliola 10–15-juga, latiuscule oblonga, subsemipollicaria. Pedunculi tenues. Corolla ad 2 lin. longa. Stamina sanguinea. Legumen ignotum.

Acacia Lambertiana, Don in Bot. Reg. t. 721.

Hab. Mexico.

Distinguished from the broad-leaved varieties of *C. portoricensis* by the hairiness and the red stamens.

28. C. PORTORICENSIS, *Benth.! in Hook. Lond. Journ.* iii. 99. Pubescens v. glabrata. Pinnæ 2–4-jugæ; petiolus eglandulosus; foliola 10–25-juga, lincaria v. lincari-oblonga, sæpius 4–6 lin. longa. Pedunculi tenues. Calyx 1 lin. longus. Corolla $1\frac{1}{2}$–2 lin. longa. Stamina alba. Legumen glabrum v. leviter puberulum, 2–4-pollicare, 2–4 lin. latum, valvis inter margines incrassatos tenuibus submembranaceis.—*Fl. Bras. Mim.*

Mimosa portoricensis, Jacq. Ic. Rar. iii. 20. t. 633.

Acacia portoricensis, Willd. Spec. iv. 1069.

A. venusta, Willd. Enum. Hort. Berol. 1052.

Mimosa guineensis, Schum. et Thonn.! Beskr. Pl. Guin. 323.

Acacia ungulata, Desv.! Journ. Bot. 1814, i. 68.

A. linearis, Desv.! in Hamilt. Prod. Fl. Ind. Occid. 59.

A. Hamiltonii, Desv.! l. c.

A. alba, Colla, Hort. Ripul. App. ii. 339.

A. Colleana, Presl, Rep. Bot. Syst. 183.

A. vespertina, Macfad.! Fl. Jam. i. 318.

Lysiloma Marchiana, Griseb.! Fl. Brit. W. Ind. 223.

Hab. Tropical America: West Indies, Mexico, Central America, British Guiana, Columbia, Ecuador, Bolivia; also introduced, or perhaps indigenous, in Brazil and West Tropical Africa.

Lysiloma Marchiana of Grisebach was founded on a specimen of this species in which the pods are old and the centre of the valves decayed, leaving the margins only, which, however, have split and become revolute as in *Calliandra,* not leaving one entire border or replum as in *Lysiloma, Mimosa,* and *Entada.*

29. C. CARACASANA. *Benth.* Pubescens v. glabrata. Pinnæ 3–6-jugæ; petiolus eglandulosus; foliola 10–25-juga, linearia, conferta, 2–3 lin. longa. Pedunculi tenues. Calyx 1 lin., corolla $1\frac{1}{2}$ lin. longa. Stamina rosea. Legumen *C. portoricensis*, 2–3-pollicare.

Mimosa caracasana, Jacq. Ic. Rar. iii. 20, t. 632.

Acacia caracasana, Willd. Spec. iv. 1068.

A. fragrans, Ten.! Cat. Hort. Nap. 1.

Hab. Tropical America: Venezuela, New Granada and Guayaquil.

I had formerly united this with *C. portoricensis*; but it appears to be constant in its smaller narrower leaflets and pink, not white, stamens. The supposed differences in the calyx are not so clear. The six preceding species, however, are very closely allied to each other, and might almost be classed as varieties of a single one.

30. C. TETRAGONA, *Benth.! in Hook. Journ. Bot.* ii. 139; *Lond. Journ.* iii. 99. Pilosa v. glabrata. Ramuli tetragoni. Pinnæ 4–6-jugæ; foliola 15–25-juga, oblongo-linearia, obliqua, 3–6 lin.longa. Pedunculi elongati. Calyx $1\frac{1}{2}$ lin., corolla 3 lin. longa. Legumen glabrum, 4–5-pollicare, 4–5 lin. latum, valvis inter margines incrassatos tenuibus.

Acacia tetragona, Willd. Spec. iv. 1069.

Mimosa quadrangularis, Poir. Dict. Suppl. i. 72.
Acacia quadrangularis, Link, Enum. Hort. Berol. ii. 445.
Hab. Tropical America: Mexico, Central America, Columbia.

31. C. ANGELICA, *Benth.! in Hook. Lond. Journ.* iii. 100. Molliter [illegible]ubescens. Pinnæ 1–2-jugæ; foliola 6–10-juga, oblongo-linearia, valde obliqua, pubescentia, 2–3 lin. longa. Pedunculi tenues. Corolla vix linea longior. Legumen ignotum.
Acacia media, Mart. et Gal.! in Bull. Acad. Brux. x. ii. 316.
Hab. Tropical America: Mexico, mountains of Regla, where it is known by the name "Cabellito de Angel," *Galeotti*, n. 3362.

32. C. MALACOPHYLLA, *Benth.! in Hook. Lond. Journ.* iii. 100. Molliter villosa. Pinnæ 1-jugæ; foliola 3–4-juga, oblique obovato-falcata, 3–6 lin. longa. Pedunculi graciles, vix pollicares. Calyx 1 lin., corolla ad 2 lin. longa. Legumen ignotum.
Hab. Tropical America: Mexico, foot of Mount San Felipe, *Andrieux*, n. 401.

33. C. TETRAPHYLLA, *Benth.* Pilosa. Pinnæ 1-jugæ; foliola 1-juga, oblique obovato-oblonga (semipollicaria?), subtus sericeo-pilosa, supra glabra, addito interdum tertio minimo. Pedunculi graciles. Calyx striatus, dentatus, ad 1 lin. longus. Corolla $2\frac{1}{2}$ lin. longa, membranacea, glabra. Legumen ignotum.
Inga tetraphylla, G. Don, Gen. Syst. ii. 392.
Hab. Mexico, *Moçino and Sessé* (*Herb. Pav.* in *Herb. Oxon.*).
The leaves are as yet but imperfectly developed in the flowering specimen, and may be larger when full-grown.

Series 3. PEDICELLATÆ.

Pinnæ 1–2-jugæ. Foliola 2- v. multijuga, parva v. subpollicaria. Glandulæ 0. Pedunculi axillares v. ad apices ramorum conferti. Flores in umbellula tenuiter pedicellati. Corolla vix striata.

34. C. LEPTOPODA, *Benth.! in Hook. Lond. Journ.* iii. 101. Glabra v. villosa. Stipulæ late cordato-orbiculatæ, foliaceæ, $\frac{1}{2}$–1-pollicares. Pinnæ 1-jugæ; foliola 2–4-juga, obovato-falcata, terminalia subpollicaria. Pedicelli corolla longiores. Legumen glabrum v. villosulum, 2–$2\frac{1}{2}$-pollicare, 4 lin. latum, valvis inter margines anguste incrassatos tenuibus.—*Fl. Bras. Mim.*
Hab. Tropical America: Brazil, prov. Bahia.

35. C. UMBELLIFERA, *Benth.! in Hook. Journ. Bot.* ii. 141; *Lond. Journ.* iii. 102. Puberula. Pinnæ sub-2-jugæ; foliola multijuga, ovali-oblonga, obtusa, subcoriacea, 1–2 rarius 3 lin. longa. Pedicelli corolla longiores. Legumen glabrum, 2–4-pollicare, 4 lin. latum, valvis inter margines incrassatos tenuiter coriaceis, transverse reticulatis.—*Fl. Bras. Mim.*
Hab. Tropical America: Brazil, prov. Piauhy and Ceara.

36. C. BLANCHETI, *Benth.! in Hook. Lond. Journ.* iii. 103. Glabra v. pilosula. Pinnæ 1-jugæ, petiolo brevissimo; foliola multijuga, oblongo-linearia, glabra, $1\frac{1}{2}$ lin. longa, nitidula. Pedicelli corolla breviores. Calyx 2 lin., corolla 4 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*
Hab. Tropical America: Brazil, prov. Bahia.

37. C. PEDICELLATA, *Benth.! in Hook. Lond. Journ.* iii. 102. Glabra v. pilosula. Stipulæ postice spinescentes. Pinnæ 1-jugæ; foliola 4–7-juga, oblonga, obtusa, coriacea, 2–3 lin. longa. Pedicelli calyce duplo longiores. Legumen sericeo-villosum, 3–4-pollicare, valvis inter margines crassos coriaceis.

Hab. Tropical America: Hayti, *Ehrenberg in Herb. Berol.*

Possibly a variety of *C. hæmatomma*, remarkable for the pedicellate flowers.

(See also 77. *C. turbinata*, 83. *C. Tweedii*, and 90. *C. Peckoltii*, in which the flowers are usually pedicellate, but the pedicels shorter than the calyx.)

Series 4. NITIDÆ.

Pinnæ 1- v. plurijugæ; foliola bi- pluri- sæpius multijuga, parva, rarius semipollicem excedentia, rigidula, supra plus minus nitida. Pedunculi axillares v. in ramulis abbreviatis subterminales, v. capitula sessilia. Flores in capitulo sessiles v. rarius pedicello calyce breviore fulti. Corolla sæpius striata. Filamenta rubra purpurea v. rarius alba.

* *Pinnæ unijugæ.*

† *Americanæ, petiolo eglanduloso.*

38. C. COLLETIOIDES, *Griseb.! in Mem. Amer. Acad.* viii. 180. Spinæ stipulares rectæ. Folia minima; pinnæ 1-jugæ; foliola 2–3-juga, addito infimo exteriore, obovata, coriacea, 1 lin. longa. Pedunculi brevissimi. Flores sericei. Legumen 1–1½-pollicare, cano-sericeum.—*Hook. Ic. Pl.* t. 1167.

Hab. Tropical America: Cuba, *Wright.*

39. C. HÆMATOMMA, *Benth.! in Hook. Lond. Journ.* iii. 103. Glabra v. pilosa. Spinæ stipulares (dorsales) rectæ. Pinnæ 1-jugæ; foliola 4–8-juga, oblonga, obtusa, 2–3 lin. longa. Pedunculi graciles. Flores sæpius sericeo-pilosi. Calyx vix lineam, corolla 3 lin. longa. Legumen 3–4-pollicare.—*Griseb. Fl. Brit. W. Ind.* 224.

Mimosa spartioides, Vahl, ex Steud.

Acacia hæmatomma, DC.! Mém. Lég. 448. t. 68.

Hab. Tropical America, West Indies, Cuba, Jamaica, St. Domingo, Bahamas.

Acacia pilosa, Spreng.! Syst. iii. 136, is described from Bertero's Jamaica specimens without flowers or fruit, and which are probably luxuriant barren branches of *C. hæmatomma*, with 10 to 13 pairs of leaflets to the pinnæ.

40. C. CHILENSIS, *Benth.! in Hook. Lond. Journ.* iii. 103. Pilis appressis canescens. Stipulæ parvæ, subspinescentes. Pinnæ 1-jugæ; foliola 3–5-juga, oblonga, obtusa v. acutiuscula, 1½ v. vix 2 lin. longa. Pedunculi semipollicares. Calyx 2 lin., corolla 4 lin. longa. Legumen pubescens, 1½-pollicare, 4 lin. latum, valvis inter margines valde incrassatos rigide membranaceis.

Acacia nigra, Clos! in C. Gay, Fl. Chil. ii. 253.

Hab. Extratropical South America: Chili, *Bridges, C. Gay.*

41. C. SESSILIS, *Benth.! in Hook. Journ. Bot.* ii. 141; *Lond. Journ.* iii. 103. Glabra v. pilosula. Stipulæ parvæ, muticæ. Pinnæ 1-jugæ; foliola 15–20-juga, falcato-oblonga, acutiuscula, 2–3 rarius 4 lin. longa. Capitula terminalia, intra folia 1–2 sessilia. Flores glabri. Calyx 1 lin., corolla 2 lin. longa, striata. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia.

42. C. AXILLARIS, *Benth.! in Mart. Fl. Bras. Mim.* Laxe pilosa. Stipulæ muticæ. Pinnæ 1-jugæ; foliola 15–30-juga, falcato-oblonga, acutiuscula, 3–4 lin. longa. Capitula axillaria, sessilia. Flores pilosuli, mox glabrati. Corolla $2\frac{1}{2}$ lin. longa, striata. Staminum tubus inclusus. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia.

43. C. ÆSCHYNOMENOIDES, *Benth.! in Mart. Fl. Bras. Mim.* Pilosa. Pinnæ 1-jugæ; foliola 5–8-juga, falcato-oblonga, vix coriacea, 4–5 lin. longa. Capitula breviter pedunculata v. subsessilia. Calyx 1 lin., corolla 2 lin. longa. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia.

44. C. DEPAUPERATA, *Benth.! in Fl. Bras. Mim.* Pilosa. Pinnæ 1-jugæ; foliola 6–10-juga, oblongo-linearia, obtusa, nitida, imbricata, vix lineam longa. Capitula breviter pedunculata. Flores tenues, glabri. Calyx 1 lin., corolla 2 lin. longa. Staminum tubus breviter exsertus. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia.

45. C. CONFERTA, *Benth.! in A. Gray, Pl. Wright.* i. 63. Subsericeo-pubescens. Pinnæ 1-jugæ; foliola 8–12-juga, oblique oblonga, coriacea, vix 2 lin. longa. Pedunculi breves, subfasciculati. Flores pauci, pilosi. Calyx 1 lin., corolla vix 2 lin. longa. Legumen sericeo-villosum, $2\frac{1}{2}$-pollicare, 3 lin. latum, valvis inter margines crassos membranaceo-coriaceis.

Hab. Extratropical North America, West Texas, and North Mexico.

46. C. BREVIPES, *Benth.! in Hook. Journ. Bot.* ii. 140; *Lond. Journ.* iii. 104. Glabra. Pinnæ 1-jugæ; foliola 15–25-juga, oblongo-linearia, falcata, nitida, 1–3 lin. longa. Capitula breviter pedunculata, subfasciculata. Calyx vix $\frac{1}{2}$ lin. Corolla 2 lin. longa. Staminum tubus inclusus. Legumen glabrum, 2–3-pollicare, 3 lin. latum, valvis inter margines crassos membranaceo-coriaceis.—*Fl. Bras. Mim.*; *Bot. Mag.* t. 4500.

Acacia Selloi, Spreng. Syst. iii. 137?

Hab. Tropical and subtropical South America: Brazil. prov. Piauhy, Bahia, Minas Geraes, Sao Paulo, and on the Uruguay.

47. C. TAXIFOLIA, *Benth.! in Hook. Lond. Journ.* iii. 104. Pubescens. Pinnæ 1-jugæ; foliola 12–25-juga, oblique oblonga, nitida, 2–3 lin. longa. Stipulæ rigide subulato-acuminatæ. Capitula breviter pedunculata, pauciflora. Calyx $\frac{3}{4}$ lin., corolla ad 3 lin. longa. Staminum tubus inclusus. Legumen ignotum.

Inga taxifolia, Kunth! Mim. 64, t. 20.

Hab. Tropical America: Andes of Quito, *Humboldt and Bonpland, Jameson.*

48. C. LONGIPINNA, *Benth.! in Mart. Fl. Bras. Mim.* Puberula v. glabrescens. Stipulæ parvæ. Pinnæ 1-jugæ; foliola 30–50-juga, oblique ovata v. oblonga, obtusa, crassa, venosa, nitida, ad 3 lin. longa. Pedunculi semipollicares. Flores pubescentes. Calyx 1–$1\frac{1}{4}$ lin., corolla 3 lin. longa, vix striata. Staminum tubus inclusus. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia.

49. C. PURPUREA, *Benth.! in Hook. Lond. Journ.* iii. 104. Glabra. Stipulæ parvæ.

Pinnæ 1-jugæ; foliola 3–7-juga, oblique ovata v. obovato-oblonga, obtusa, coriacea, nitida, venosa, 4–6 lin. longa. Capitula pedunculata, glabra. Calyx 1 lin., corolla ad 3 lin. longa. Staminum tubus inclusus v. breviter exsertus. Legumen glabrum, sublignosum, 2–2½-pollicare, 3–4 lin. latum, valvis inter margines crassos coriaceis.

Mimosa purpurea, Linn. Spec. 1500; Andr. Bot. Rep. t. 372.
Inga purpurea, Willd. Spec. iv. 1021, Bot. Reg. t. 129.
Inga obtusifolia, Willd. Spec. iv. 1022.
Mimosa obtusifolia, Poir. Dict. Suppl. i. 46.
Calliandra obtusifolia, Karst. Fl. Colomb. ii. 41, t. 131.
C. coroensis, Karst.! l. c. 41.

Hab. Tropical America: West Indies, Demerara, and Cumana.

Among the numerous specimens I have now had before me, I have been unable to separate Karsten's three species as distinct varieties. The number and size of the leaflets is very variable.

50. C. TENUIFLORA, *Benth.! in Mart. Fl. Bras. Mim.* Glabra v. pubescens. Stipulæ lanceolatæ. Pinnæ 1-jugæ; foliola 5–6-juga, oblique obovata v. subrhombea, obtusa, terminalia subpollicaria, glabra, nitida. Pedunculi subsemipollicares. Calyx 1–1¼ lin., corolla 3–3½ lin. longa, non striata. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Para.

51. C. MAGDALENÆ, *Benth.! in Hook. Lond. Journ.* v. 102. Glabra v. vix puberula. Stipulæ breves. Pinnæ 1-jugæ; foliola 15–30-juga, oblongo-linearia v. falcato-oblonga, obtusa, glabra, nitida, ad 3 lin. v. interdum 4–6 lin. longa. Pedunculi breves. Calyx ¾ lin., corolla ad 2 lin. longa. Staminum tubus exsertus. Legumen glabrum, sublignosum, crassiusculum, 4-pollicare, fere 5 lin. latum.

Acacia Magdalenæ, Bert.! in DC. Prod. ii. 455, et in Spreng. Syst. iii. 137.

Hab. Tropical America: Santa Marta, *Bertero*, *Purdie*; Veraguas, *Seemann*; on the Bombonasa in Ecuador, *Spruce*.

52. C. SURINAMENSIS, *Benth.! in Hook. Lond. Journ.* iii. 105. Glabra v. puberula. Pinnæ 1-jugæ; foliola 8–12-juga, oblique oblongo-laceolata, 4–8 lin. longa, nitida. Pedunculi tenues. Flores glabri. Calyx 1 lin., corolla 2½–3 lin. longa. Staminum tubus longe exsertus. Legumen glabrum, 2–3-pollicare, 4 lin. latum, valvis inter margines crassos tenuibus.—*Fl. Bras. Mim.*

Inga fasciculata, Willd.! Spec. iv. 1022.
Mimosa fasciculata, Poir. Dict. Suppl. i. 46.

Hab. Tropical America: Brazil, prov. Goyaz, Rio Negro, and Para; Guiana and Columbia.

Inga pubiramea, Steud. in Flora 1843, 759, from the number quoted, 171, of Hostman's Surinam plants, should be this species; but the character given scarcely agrees with it.

53. C. CODONANDRA, *Benth.* Pilosula. Pinnæ 1-jugæ; foliola 30–40-juga, oblongo-linearia, subfalcata, glabra, nitida, 4–5 lin. longa. Pedunculi breves, rigidi. Calyx ¾ lin., corolla 3 lin. longa. Legumen durum, glabrum, 4-5-pollicare, valvis inter margines latos crassis.

Codonandra purpurea, Karst. Fl. Colomb. ii. 43, t. 122.

Hab. Tropical America: Venezuela, prov. Coro, *Karsten*.

In this species, according to Karsten, it is the two or three central enlarged flowers alone that are fertile; and on that ground he distinguished it generically. The central flowers are similarly enlarged in many species of *Calliandra*, and, I believe, sometimes, but not always, fertile; the specimens, however, are very rarely sufficient to show whether the fruits are formed in one only or both the forms of flowers in the head.

54. C. VIRGATA, *Benth. ! in Hook. Journ. Bot.* ii. 140, *Lond. Journ.* iii. 105. Glabra v. vix puberula. Pinnæ 1-jugæ; foliola 20–30-juga, lanceolata, subfalcata, rigida, 4–8 lin. longa. Pedunculi rigidi, longiusculi. Calyx 1 lin., corolla $3\frac{1}{2}$ lin. longa, glabra, leviter striata. Staminum tubus longe exsertus. Legumen sublignosum, glabrum, 2-pollicare, valvis inter margines latos crassis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes, Pernambuco, and Goyaz.

Mimosa staminea, Thunb. Diss. ex Flora, 1821, 332, from Minas Geraes, is probably this species rather than the *C. brevipes*.

55. C. HÆMATOCEPHALA, *Hassk. ! Retzia*, 216. Glabra. Pinnæ 1-jugæ; foliola 7–10-juga, oblique oblongo-lanceolata, obtuse acuminata, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria, coriacea, nitida. Pedunculi rigidi. Flores glabri. Calyx 1 lin., corolla fere 6 lin. longa, striata. Staminum tubus inclusus. Legumen glabrum, nitidum, 4-pollicare, ad 6 lin. latum, valvis inter margines valde incrassatos tenuiter coriaceis.

Hab. Raised in the Botanic Garden, Calcutta, from seeds of unrecorded origin.

This species appears to be allied to the American *C. virgata*, but with fewer, much larger leaflets, bringing it near to the plurifoliolate *Macrophyllæ*. The corolla is also considerably longer than in *C. virgata*, and the pod very different. It has no affinity with any of the few Old-World species known to me.

†† *Gerontogeæ, petiolo communi glandulifero.*

56. C. ALTERNANS, *Benth.* Ramuli rufo-pubescentes v. glabri. Stipulæ obsoletæ. Pinnæ 1-jugæ; foliola 4–10-juga, inferiora sæpe alterna, late oblonga, obliqua, obtusissima, nitida, pennivenia, 3–4 rarius 6 lin. longa. Pedunculi filiformes. Spicæ oblongæ. Corolla calyce striato 3–4plo longior. Legumen 6–8-pollicare, ad 4 lin. latum, valvis inter margines incrassatos tenuiter coriaceis reticulatis demum glabris.

Mimosa alternans, Vahl! in Herb. Mus. Par.

Hab. Madagascar, *Commerson, Perrillé, Gerard.*

Frutex ramis tenuibus rigidis. Foliorum petiolus communis $\frac{1}{2}$–2 lin. longus, pinnarum rhaches $1\frac{1}{2}$–2-pollicares, tenues, puberuli. Foliola subtus pallida, costa subcentrali. Pedunculi tenues, ad nodos vetustos fasciculati v. solitarii, cum spicæ rhaehe pollicares v. vix longiores. Flores sessiles, nunc apicem versus pauci, nunc fere ad medium pedunculi extensi. Calyx vix $\frac{1}{2}$ lin. longus, obtuse dentatus. Corolla 2 lin. longa, profunde 4- (v. 5-?)fida. Stamina 4–5 lin. longa, basi brevissime connata in tubum corollæ basi adnatum.

57. C. ? GEMINATA, *Benth.* Ramuli puberuli. Stipulæ pleræque spinescentes. Pinnæ 1-jugæ. Foliola 2–5-juga, obovato-oblonga, valde obliqua, glabra, 6–9 lin. longa, addito exteriore minore ad basin rhacheos. Pedunculi tenues. Capitula glabra, pauciflora. Corolla calyce subtriplo longior. Legumen ignotum.

Inga geminata, Wight et Arn.! Prod. Fl. Penins. Ind. Or. 269.

Pithecolobium geminatum, Benth.! in Hook. Lond. Journ. iii. 202.
Inga flexuosa, Grah.! in Wall. Cat. Herb. Ind. n. 5286.
Hab. Ceylon, *Mackenzie, Gardner, Thwaites,* n. 1531.

The fruit of this plant not having been yet observed, its affinities cannot be determined with certainty. I had placed it in *Pithecolobium,* notwithstanding considerable discrepancy in the foliage; for I had then thought that *Calliandra* was confined to America; but we have now three other undoubted Old-World species of *Calliandra*; and the present species has so much in common with the *C. alternans,* that there remains very little doubt that it will prove to be a congener.

** Paucijugæ. *Pinnæ pleræque bi- v. paucijugæ. Corollæ glabræ v. parce pilosulæ* (in G. Gardneri *canescentes*). *Legumen glabrum minute tomentellum v. parce villosulum.*

58. C. EXPANSA, *Benth.*, sp. n. Glabra v. rarissime pilosula. Folia parva. Pinnæ 2- rarius 1-jugæ; foliola 10–15-juga, falcato-linearia, nitida, 1–1½ lin. longa. Pedunculi tenues. Calyx ½ lin. longus, vix striatus. Corolla 2 lin. longa. Legumen sublignosum, glabrum, 1½-pollicare, 2–3 lin. latum.

Mimosa expansa, Herb. Pav.

Hab. Tropical America: Peru near Huanuco, etc., *Ruiz and Pavon, Lobb.*

Rami crassiusculi, rigidi, albi, ut videtur divaricati v. forte in rupes prostrati. Stipulæ parvæ, ovato-lanceolatæ. Foliorum petiolus communis vix lineam longus; pinnæ rigidulæ, 4-6 lin. longæ. Foliola obtusa v. acutiuscula, glabra v. subtus pilosula. Pedunculi 3–4 lin. longi. Corollæ limbus late campanulatus, haud striatus. Legumen more generis basin versus longe contractum.

59. C. SQUARROSA, *Benth.! in Hook. Journ. Bot.* iii. 104. Glabra v. parce sericeo-pilosa. Pinnæ sub-2-jugæ; foliola 20–30-juga, linearia, conferta, nitida, 1½ lin. longa. Pedunculi 6–9 lin. longi. Flores glabri, striati. Calyx 1 lin., corolla 2½ lin. longa. Staminum tubus subinclusus. Legumen glabrum v. villosulum, 2½-pollicare, 4–5 lin. latum, marginibus latis crassisque.—*Fl. Bras. Mim.*

Acacia squarrosa, Mart. Herb.

Hab. Tropical America: Brazil, prov. Bahia.

60. C. LINEARIS, *Benth. in Hook. Lond. Journ.* v. 103. Humilis, glabra. Pinnæ 2-jugæ; foliola 8–12-juga, anguste linearia, nitidula, 4–6 lin. longa. Pedunculi pollicares, crassiusculi. Flores glabri. Calyx ¾ lin., corolla 3–3½ lin. longa, lævis. Staminum tubus inclusus. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes, *Riedel in Herb. Petrop.*

61. C. RIGIDA, *Benth.! in Hook. Lond. Journ.* v. 103. Rami virgati, rigidi, rufo-villosi. Stipulæ ovatæ. Pinnæ sub-2-jugæ; foliola 25–40-juga, anguste linearia, rigida, 4–6 lin. longa. Pedunculi pollicares, rigidi. Flores pilis paucis conspersi. Calyx 1–1½ lin., corolla 3–3½ lin. longa. Legumen sublignosum, minute puberulum, 4-5-pollicare, 6–8 lin. latum.

C. Hookeriana, Schomb.! in Linnæa, xx. 754.

Hab. Tropical America: British Guiana, Caramany Valley.

62. C. CALYCINA, *Benth.! in Mart. Fl. Bras. Mim.* Glabra v. leviter pilosula. Stipulæ angustæ v. obsoletæ. Pinnæ 2-jugæ v. foliorum inferiorum 1-jugæ; foliola 20–30-juga, anguste linearia, rigida, nitida, 3–4 lin. longa. Pedunculi rigidi, 1–1½-pollicares.

Capitula glabra, pauciflora. Calyx 2 lin., corolla 4 lin. longa. Staminum tubus breviter exsertus. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia.

63. C. BRACTEOSA, *Benth.! in Hook. Lond. Journ.* v. 104. Glabra v. vix pilosula. Stipulæ lanceolatæ. Pinnæ 2- rarius 3-jugæ; foliola 20–30-juga, linearia, nitida, 3–5 lin. longa. Pedunculi rigidi, 1½-pollicares. Bracteæ exteriores amplæ, foliaceæ. Calyx corolla 4-lineari parum brevior. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

64. C. MERTENSIOIDES, *Benth.! in Hook. Lond. Journ.* iii. 106. Hirtella. Stipulæ parvæ. Pinnæ 2–3-jugæ; foliola 12–20-juga, oblonga, obtusa, coriacea, nitida, majora 3–4 lin. longa. Pedunculi ad apices ramorum conferti, rigidi, 1–2-pollicares. Calyx 1 lin., corolla fere 4 lin. longa. Staminum tubus inclusus. Legumen rigidum, 1½-pollicare, glabrum v. tomentellum.—*Fl. Bras. Mim.*

Acacia asplenioides, Nees in Flora, 1821, 303.

Inga mertensioides, Nees et Mart. in Nov. Act. Nat. Cur. xii. 35, t. 5.

Hab. Tropical America: Brazil, prov. Bahia.

65. C. FASCICULATA, *Benth.! in Hook. Journ. Bot.* ii. 140; *Lond. Journ.* iii. 108. Glabra v. minute tomentella. Stipulæ parvæ. Pinnæ 2–4-jugæ; foliola 20–30-juga, falcato-linearia, obtusiuscula, coriacea, nitida, 3–4 lin. longa. Pedunculi ¾–1½-pollicares, rigidi. Capitula glabra. Calyx ½–1 lin., corolla 2½–4 lin. longa. Legumen sublignosum, glabrum v. junius villosulum, 1½–3-pollicare, 3–4 lin. latum, marginibus latis crassisque.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Bahia.

It is not improbable that further observation may induce the reunion of this somewhat variable species with the *C. mertensioides,* and that even *C. bracteosa* may prove to be a variety only, with abnormally developed bracts and calyces.

66. C. HIRTIFLORA, *Benth.! in Mart. Fl. Bras. Mim.* Patentim pilosa, demum glabrescens. Pinnæ 3–5-jugæ; foliola 20–30-juga, falcato-linearia, nitida, 4–5 lin. longa. Pedunculi 2–3-pollicares, ad apices ramorum conferti, floresque piloso-hispidi. Calyx 2 lin., corolla fere 6 lin. longa. Legumen lignosum, glabrescens, 2–3-pollicare, 3–4 lin. latum.

Hab. Tropical America: Brazil, prov. Bahia.

Although nearly allied to the preceding species, the few specimens I have seen show too many points of distinction to admit of their being united with it without further observation.

67. C. RETICULATA, *A. Gray! Pl. Wright.* ii. 53. Humilis, pilosa, mox glabrata. Pinnæ 1–3-jugæ; foliola 4–11-juga, ovalia, obtusa, 2–5-nervia, reticulata, 3–5 lin. longa. Pedunculi breves. Calyx hirsutus, 1½ lin., corolla glabriuscula, 3 lin. longa. Legumen glabellum, 1½-pollicare, fere 3 lin. latum, valvis inter margines crassos submembranaceis.

Hab. Extratropical North America: New Mexico, *Wright, Emory's expedition.*

68. C. GARDNERI, *Benth.! in Hook. Lond. Journ.* iii. 108. Humilis, glabra. Pinnæ 2–3- rarius plurijugæ; foliola 15–20-juga, oblonga, obtusa, obliqua, coriacea, venosa,

4–6 lin. longa. Pedunculi rigidi, 3–4-pollicares. Flores glabri v. tomentelli. Calyx 2 lin., corolla semipollicem longa. Legumen minute puberulum, 4–5-pollicare, 7–8 lin. latum, valvis inter margines incrassatos tenuibus reticulatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Goyaz.

69. C. LAXA, *Benth.* Pilosula v. glabra. Pinnæ 2–5-jugæ; foliola 12–30-juga, oblique ovalia v. falcato-oblonga, obtusa v. acutiuscula, 3–6 lin. longa, supra nitida subtus pallida. Pedunculi $\frac{1}{2}$–1-pollicares. Flores glabriusculi. Calyx $1\frac{1}{4}$, corolla ad 3 lin. longa. Legumen sublignosum, glabrum v. junius tomentellum, 3–4-pollicare, ad 6 lin. latum, marginibus latis crassisque.

Acacia laxa, Willd. Spec. iv. 1069.

Mimosa laxa, Poir. Dict. Suppl. i. 72.

Calliandra xalapensis, Benth.! in Hook. Lond. Journ. iii. 106.

Acacia rubescens, Mart. et Gal.! in Bull. Acad. Brux. x. ii. 315.

Var.? PARVIFOLIUM, foliolis vix 2 lin. longis petiolis tenuibus; legumen paullo minus, rufo-tomentellum.

Hab. Tropical America: Mexico, Central America, Columbia, British Guiana; the var. *parvifolium,* Venezuela, *Fendler,* n. 2255.

Fendler's n. 2254, with small obtuse leaflets and small flowers, appears to me to be a distinct species; but the specimen is scarcely sufficient to determine its affinities.

70. C. STIPULACEA, *Benth.! in Hook. Journ. Bot.* ii. 137; *Lond. Journ.* iii. 107. Glabra v. vix puberula. Stipulæ lanceolatæ, 3–4 lin. longæ. Pinnæ 3–4-jugæ; foliola 8–10-juga, oblique oblonga v. obovata, coriacea, glabra, 6–8 lin. longa. Pedunculi ad apices ramorum conferti, rigidi. Flores glabri. Calyx $1\frac{1}{4}$ lin., corolla fere 4 lin. longa. Legumen ignotum.

Hab. Tropical America: British Guiana on the Rio Quitaro, *Schomburgk.*

71. C. COMOSA, *Benth.! in Hook. Lond. Journ.* v. 104. Subglabra. Pinnæ 3-jugæ; foliola 9–10-juga, ovalia, obtusissima, basi late truncata, 4–6 lin. longa, siccitate nigricantia. Capitula glabra, 4–8-flora, pedunculis 4–6 lin. longis fulta, in racemos plures pollicares ad apices ramorum confertim corymbosos disposita. Legumen glabrum, immaturum jam 3-pollicare.

Mimosa comosa, Sw.! Fl. Ind. Occid. ii. 980.

Inga comosa, Willd. Spec. Pl. iv. 1026.

Pithecolobium comosum, Benth. in Hook. Lond. Journ. iii. 221.

Hab. Tropical America: Jamaica, rocky mountains of the north coast, where it does not appear to have been gathered since the days of *Swartz.* The inflorescence is very peculiar.

*** Subsericeæ. *Pinnæ 2–6-jugæ. Foliola 8- v. multijuga oblongo-linearia. Flores pilosuli v. subsericei. Legumen hirsutum v. glabrescens. Species Mexicanæ v. Centro-Americanæ, inter Paucijugas et Sericifloras subintermediæ.*

72. C. CUMINGII, *Benth.! in Hook. Journ. Bot.* ii. 140; *Lond. Journ.* iii. 106. Puberula. Pinnæ 2–6-jugæ; foliola 10–25-juga, oblongo-linearia, falcata, coriacea, nitida,

2–3- rarius 4 lin. longa. Pedunculi tenues $\frac{3}{4}$–$1\frac{1}{2}$-pollicares. Flores pilis longis conspersi. Calyx vix $\frac{1}{2}$ lin., corolla fere 4 lin. longa. Legumen sublignosum.

Inga speciosa, Mart. et Gal. ! in Bull. Acad. Brux. x. ii. 320.

Hab. Tropical America: Panama, *Cuming*; Oaxaca, *Galeotti*; Chachapoyas in Peru, *Matthews*.

The specimens I have seen are none of them very satisfactory; but I believe they all belong to one species.

73. C. HUMILIS, *Benth.! in Hook. Lond. Journ.* v. 103. Humilis, pilosa v. rarius glabriuscula. Pinnæ 3–6-jugæ; foliola 8–25-juga, oblongo-linearia, obtusa, 1–2 lin. longa. Pedunculi pollicares v. breviores. Calyx 1–$1\frac{1}{4}$ lin., corolla ad 3 lin. longa. Legumen 2–3-pollicare, 3 lin. latum, junius hirsutum demum subglabrum, valvis inter margines latos crassosque membranaceo-coriaceis.

Acacia humilis, Schlecht. in Linnæa, xii. 567, ex char.

C. herbacea, Engelm. ! in A. Gray, Pl. Fendl. 39.

Hab. Subtropical North America: Central and Northern Mexico.

74. C. ERIOPHYLLA, *Benth.! in Hook. Lond. Journ.* iii. 105. Humilis, tomentoso-villosa. Pinnæ 2–7-jugæ; foliola 10–20-juga, oblongo-linearia, obtusiuscula, 1–$2\frac{1}{2}$ lin. longa, subtus sericeo-villosa. Pedunculi tenues, 1–$1\frac{1}{2}$-pollicares. Flores pilosi. Calyx $\frac{3}{4}$ lin., corolla vix 3 lin. longa. Legumen sericeo-hirsutum, 2–4-pollicare, valvis inter margines crassos latosque coriaceis.

C. chamædrys, Engelm. ! in A. Gray, Pl. Fendl. 39, Pl. Wright. ii. 52.

Hab. Tropical and extratropical North America: Mexico and West Texas.

75. C. CALIFORNICA, *Benth.! Bot. Sulph.* 14, t. 11, *et in Hook. Lond. Journ.* iii. 105. Rigida, appresse pilosa. Pinnæ 2–4-jugæ; foliola 8–15-juga, oblonga, obtusiuscula, pilosula, nitida, 2–3 lin. longa. Pedunculi tenues. Flores pubescentes. Calyx vix $\frac{1}{2}$ lin., corolla fere 4 lin. longa. Legumen ignotum.

Hab. Extratropical North America: Bay of Magdalena, Lower California.

This may possibly prove to be a variety of *C. Cuningii*.

**** Sericifloræ. *Pinnæ* (*excepta* C. abbreviata) 4- *v. plurijugæ. Foliola multijuga, oblonga v. linearia. Flores sericeo-villosi v. hirsutissimi. Legumen crassum dense villosum.*

76. C. DYSANTHA, *Benth.! in Hook. Journ. Bot.* ii. 138, *Lond. Journ.* iii. 109. Pubescens. Pinnæ 4–6-jugæ; foliola 20–50-juga, falcato-oblonga, rigidula, 4–8 lin. longa, subtus sæpius pilosa. Capitula sessilia, ad apices ramorum conferta. Flores sericeo-villosissimi. Calyx 2 lin., corolla 5–7 lin. longa. Legumen crassum, sublignosum, 4–5-pollicare, villosissimum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes, and Goyaz.

77. C. TURBINATA, *Benth.! in Hook. Lond. Journ.* iii. 109. Pubescens. Pinnæ 8–12-jugæ; foliola 20–40-juga, falcato-oblonga, rigidula, semipollicaria, ciliata. Capitula ad apices ramorum breviter pedunculata. Flores villosissimi. Calyx 3 lin., corolla 4–$4\frac{1}{2}$ lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Mattogrosso.

78. C. LANATA, *Benth.! in Mart. Fl. Bras. Mim.* Dense lanato-villosa. Stipulæ maximæ, latæ, caducæ. Pinnæ 3–8-jugæ; foliola 20–40-juga, falcato-linearia, 4–6 lin. longa, sericeo-pilosa v. glabrata. Pedunculi crassi, ½–1-pollicares. Flores dense lanato-villosi. Calyx 3 lin., corolla ad 6 lin. longa. Legumen lignosum, densissime villoso-lanatum, 3-pollicare, 5–6 lin. latum.

Hab. Tropical America: Brazil, prov. Minas Geraes.

79. C. ABBREVIATA, *Benth.! in Hook. Lond. Journ.* iii. 108. Villosula v. glabrata. Pinnæ 2–3-jugæ; foliola 15–20-juga, oblique oblonga, coriacea, venulosa, 6–9 lin. longa. Pedunculi breves, crassi, floresque dense sericeo-villosi. Calyx 1½ lin., corolla 4 lin. longa. Legumen sublignosum, dense villosum, 4–5-pollicare, 5–6 lin. latum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Piauhy and Pernambuco.

80. C. MACROCEPHALA, *Benth.! in Hook. Journ. Bot.* ii. 140, *Lond. Journ.* iii. 108. Pilosa. Pinnæ 3–7-jugæ; foliola 20–50-juga, oblique ovato-oblonga, rigidula, 3–5 lin. longa. Pedunculi crassi, 1–3-pollicares, floresque rufo-hirsutissimi. Calyx 2–3 lin., corolla 5–6 lin. longa. Legumen sublignosum, dense villosissimum, 4–5-pollicaria, 5–6 lin. latum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes, and Goyaz.

81. C. VISCIDULA, *Benth.! in Hook. Lond. Journ.* iii. 109. Villosa. Pinnæ 3–5-jugæ; foliola 16–30-juga, falcato-oblonga, rigida, demum glabrata, 4–5 lin. longa. Pedunculi rigiduli, 1½-pollicares. Bracteæ floresque viscidulo-villosi. Calyx 4 lin. longus. Corolla vix calycem excedens, villosissima. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia, and a variety, said to have white stamens, prov. Minas Geraes.

82. C. FOLIOLOSA, *Benth.! in Hook. Lond. Journ.* iii. 110. Pilosa. Pinnæ 3–9-jugæ; foliola 40–60-juga, anguste linearia, nitida, 2–3 lin. longa. Pedunculi pollicares longioresque, ad apices ramorum conferti. Flores sericeo-villosi. Calyx 3–4 lin., corolla ½ poll. longa. Legumen crassum, sublignosum, dense villosum, 2–2½-pollicare, 4–5 lin. latum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

83. C. TWEEDII, *Benth.! in Hook. Journ. Bot.* ii. 140; *Lond. Journ.* iii. 107. Pilosa. Pinnæ 3–4-jugæ; foliola 20–30-juga, oblongo-linearia, nitida, obliqua, 2–3 lin. longa. Pedunculi 1–2-pollicares. Flores breviter pedicellati, molliter pilosi. Calyx 2 lin., corolla 4 lin. longa. Legumen crassum, sublignosum, dense villosum, 2–3-pollicare.—*Fl. Bras. Mim.*; *Bot. Mag.* t. 4188.

Hab. Tropical and subtropical South America: Sao Paulo and other southern provinces of Brazil and on the Rio Grande.

Var.? SANCTI PAULI. Pinnæ 5–10-jugæ. Pedicelli exteriores fere lineam longi.

Calliandra Sancti Pauli, Hassk. Retzia, 214.

Raised in the botanic garden of Buitenzorg, in Java, probably from South Brazilian seeds.

84. C. CRUEGERII, *Griseb.! Fl. Brit. W. Ind.* 224. Sericeo-villosa, mox glabrescens. Pinnæ 3–6-jugæ; foliola 20–40-juga, falcato-linearia, acutiuscula, nitida, ciliata, gla-

brescentia, ad 3 lin. longa. Capitula subsessilia. Flores hirsuti. Calyx 1½ lin., corolla 3 lin. longa. Legumen ignotum.

Hab. Tropical America: Trinidad, *Crueger*.

This species appears to differ from *C. Tweedii* chiefly in its sessile flower-heads; the specimens I have seen, however, are very imperfect.

85. C. HIRSUTA, *Benth.* Subsericeo-villosa. Pinnæ 3–5-jugæ; foliola 15–20-jnga, oblongo-linearia, subfalcata, subtus sericeo-villosa, 2–3 lin. longa. Pedunculi 1½–2-pollicares. Flores sericei, breviter pedicellati. Calyx 4–4½ lin. longa. Legumen junius densissime villosum.

Inga hirsuta, G. Don, Gen. Syst. ii. 395.

Hab. Tropical or subtropical North America: "New Spain," *Herb. Pavon* (now in *Herb. Oxon.*); raised also in the Cambridge (United States) Botanic Garden from New Mexican seeds.

Species *C. Tweedii* quam maxime affinis. Stipulæ breves, lanceolatæ, muticæ, sublanato-villosæ. Ramuli petioli et foliolorum pagina inferior in speciminibus typicis dense subappresse villosi v. fere lanati; in specimine culto villi minus densi. Foliorum petiolus communis ½–1-pollicaris, pinnæ 1–2-pollicares. Foliola rigida, supra demum glabrata nitidaque. Pedicelli ut in *C. Tweedii* ½–1 lin. longi. Calyx sericeus, breviter dentatus. Corollæ limbus anguste campanulatus, 5-fidus. Legumen perfectum non vidi; junius omnino *C. Tweedii*.

Were it not for the widely dissevered geographical station, I should have been disposed to consider this a marked variety only of *C. Tweedii*.

86. C. GLOMERULATA, *Karst. Fl. Colomb.* ii. 5, t. 103. Subferrugineo-pubescens v. villosa. Pinnæ 4–12-jugæ. Foliola 20–40-juga, oblonga v. oblongo-linearia, obtusiuscula, 1–3 lin. longa, utrinque villosa. Pedunculi breves nunc brevissimi. Flores villosi. Calyx 1 lin., corolla ad 3 lin. longa. Legumen crassum, sublignosum, dense villosissimum, 2–2½-pollicare, 7–8 lin. latum.

Hab. Tropical America: New Granada, *Linden* n. 696, *Triana*; Caracas, *Birschel*; Venezuela, *Fendler* n. 2256.

"Arbor 25–30-pedalis." Ramuli et petioli pube brevi ferruginea villis longioribus intermixtis vestiti. Stipulæ breves, ad nodos floriferos more generis imbricatæ. Foliorum petiolus commuuis 1½–3-pollicaris, pinnæ 1–2-pollicares. Foliora latiora obtusiora et minus rigida quam in *C. Tweedii*, supra demum nigricantia, laxiuscule pilosa v. demum scabro-pubescentia, subtus pallida, densius villosa, costa subcentrali sub villis recondita. Pedunculi crassi, ferrugineo-villosi, nunc brevissimi v. vix ulli, nunc fere semipollicares. Calyx striatus, villosulus, breviter dentatus. Corollæ limbus campanulatus, alte 5-fidus, extus dense sericeus. Stamina haud numerosa, 1½-pollicaria, basi breviter monadelpha. Legumen villis subferrugineis in speciminibus nostris densissime velutino-villosum, ex Karstenio breviter tomentosum. Planta nostra cæterum cum icone et descriptione convenit.

***** Microphyllæ. *Pinnæ 4- v. multijugæ, rarius hinc inde 2–3-jugæ. Foliola multijuga, parva, linearia. Flores glabri v. leviter pilosuli.*

87. C. PROSTRATA, *Benth.*, sp. n. Parce pilosa, prostrata, ramosissima. Folia parva, conferta; pinnæ 2–4-jugæ; foliola 8–12-juga, vix lineam longa, anguste linearia. Capitula breviter pedunculata, pauciflora. Calyx ¾ lin., corolla vix 2 lin. longa. Legumen ignotum.

Hab. Tropical America: Peru, *M'Lean in Herb. Hook.*

Ramuli crassi, rigidi, tortuosi, novelli pilosuli, demum glabrati, albidi. Foliorum petiolus communis

2–3 lin. longus, pinnæ eadem longitudine. Foliola nitidula, vix hinc inde ciliata, tenuia, conferta. Capitula cum foliis in ramulis brevissimis v. ad nodos foliatos conferta, pedicello tenui 1–2 lin. longo fulta, 4–6-flora. Stamina haud numerosa, semipollicaria, tubo incluso.

88. C. MICROPHYLLA, *Benth. ! in Hook. Journ. Bot.* ii. 139; *Lond. Journ.* iii. 110. Glabra v. vix puberula. Pinnæ 15–20-jugæ; foliola 20–40-juga, oblongo-linearia, imbricata, vix lineam longa. Pedunculi crassi, $\frac{1}{2}$–1-pollicares. Flores sessiles, glabri. Calyx $1\frac{1}{4}$ lin., corolla 4 lin. longa. Legumen durum, 3-pollicare, 3–4 lin. latum, valvis inter margines latos crassos glabros breviter velutinis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes and Goyaz.

89. C. MYRIOPHYLLA, *Benth. ! in Hook. Lond. Journ.* iii. 111. Sericeo-villosula v. demum glabrata. Pinnæ 10–20-jugæ; foliola 20–40-juga, oblongo-linearia, imbricata, 1–$1\frac{1}{2}$ lin. longa. Pedunculi crassi, pollicares. Flores glabri, exteriores breviter pedicellati. Calyx $1\frac{1}{4}$ lin., corolla 3 lin. longa. Legumen sublignosum, 3–4-pollicare, 3–4 lin. latum, undique glabrum, marginibus angustis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes and Goyaz.

Very near *C. microphylla*, but, I believe, a distinct species.

90. C. PECKOLTII, *Benth. ! in Mart. Fl. Bras. Mim.* Pubescens. Pinnæ 8–15-jugæ; foliola 40–60-juga, angustissime linearia, linea breviora. Pedunculi tenues, pollice breviores. Flores glabri, tenuiter pedicellati. Calyx $\frac{3}{4}$ lin., corolla $1\frac{1}{2}$ lin. longa. Stamina pauca. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

91. C. BICOLOR, *Benth. ! in Hook. Journ. Bot.* ii. 139: *Lond. Journ.* iii. 107. Pilosula v. glabrata. Pinnæ 3–6-jugæ; foliola 20–30-juga, linearia, nitida, 1–2 lin. longa. Pedunculi $1\frac{1}{2}$-pollicares. Flores sessiles, glabri. Calyx $1\frac{1}{2}$ lin., corolla 3 lin. longa. Legumen pilis brevibus conspersum, 2–3-pollicare, valvis inter margines angustos coriaceis.—*Fl. Bras. Mim.*

Inga parvifolia, Hook. et Arn. ! in Hook. Bot. Misc. iii. 202.

Calliandra diademata, Lem. Jard. Fleur. t. 305, 306, ex ic. et descr.

Hab. Tropical and subtropical South America: southern provinces of Brazil and on the Uruguay.

92. C. CRASSIPES, *Benth. ! in Mart. Fl. Bras. Mim.* Fusco-pubescens. Pinnæ in petiolo crasso 4–8-jugæ; foliola multijuga, falcato-linearia, obtusa, crassa, puberula, ad lin. longus. Corolla calycem parum excedens. Legumen (si rite hic adscriptum) ligNosum, fusco-puberulum, 3-pollicare, 4 lin. latum.

Hab. Tropical America: Brazil, prov. Bahia and Minas Geraes.

93. C. BELLA, *Benth. ! in Hook. Lond. Journ.* iii. 110. Brevissime puberula. Pinnæ 12–15-jugæ; foliola 25–40-juga, linearia, acuta, 2, rarius 3 lin. longa. Capitula pedunculata, ad apices ramorum conferta v. breviter racemosa. Flores subsessiles, puberuli. Calyx linea paullo longior. Corolla $3\frac{1}{2}$ lin. longa. Stamina numerosissima. Legumen formæ typicæ ignotum.

Acacia bella, Spreng. Syst. iii. 141.

Hab. Tropical America: Brazil, prov. Bahia.

Var. ? Trianæ, foliolis floribusque minoribus. Huic legumen glabrum, 2½–3½-pollicare, 4–5 lin. latum, valvis inter margines lignoso-coriaceis reticulatis.

Hab. New Granada, *Triana, Jervise, Schlim* n. 783.

Linden's specimens, n. 696, which I had at first thought might be a variety of *C. bella*, belong evidently to a many-pinnate form of *C. glomerulata*, with the densely villous thick pod of the *Sericifloræ*.

Acacia brasiliensis, Spreng. Syst. iii. 142, from the very imperfect diagnosis, may not be distinct from *C. bella*.

94. C. Purdiæi, *Benth.! in Hook. Lond. Journ.* iii. 104. Ferrugineo-pubescens. Pinnæ 8–12-jugæ; foliola 30–40-juga, oblongo-linearia, obtusiuscula, ciliata, 2–3 lin. longa. Pedunculi 1–2½-pollicares. Flores sessiles, subglabri. Calyx 3 lin., corolla 6 lin. longa. Legumen pilosulum, 3-pollicare, 4–5 lin. latum.

C. clavellina, Karst. Fl. Colomb. i. 159, t. 79 ex ic. et descr.

Hab. Tropical America: mountains of Ocaña, New Granada, *Purdie, Schlim* n. 203; the same locality indicated by *Karsten*.

95. C. subspicata, *Benth. ! in Mart. Fl. Bras. Mim.* Glabra. Pinnæ 2–4-jugæ; foliola multijuga, linearia, nitida, eleganter pectinata, 2–3 lin. longa. Capitula ovoideo-globosa, sessilia v. breviter pedunculata, ad apices ramorum conferta v. breviter thyrsoidea. Flores subsessiles, glabri. Calyx 1 lin., corolla 3 lin. longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia.

This species and some specimens of *C. bella* have a tendency towards the inflorescence of the following series.

Series 5. Racemosæ.

Pinnæ multi- rarius unijugæ. Foliola multijuga. Petiolus eglandulosus. Capitula pauciflora, in racemum thyrsoideum seu paniculam terminalem aphyllam disposita.

96. C. Wendlandi, *Benth.*, sp. n. Velutino-villosa. Pinnæ unijugæ; foliola multijuga, linearia, falcata, 2–3 lin. longa. Racemus elongatus, thyrsoideus. Flores pedicellati, strigoso-sericei. Legumen crassum, villosissimum.

Hab. Tropical America: Guatemala, *Wendland*.

Species ab omnibus *Racemosis* differt pinnis unijugis. Habitus indumentum inflorescentia flores et legumina fere *C. Houstoni*. Foliorum petiolus communis 2–3 lin. longus, pinnæ pollicares, foliolis confertis. Filamenta purpurea, numerosa, 2½–3-pollicaria.

97. C. calothyrsus, *Miq. in Linnæa*, xxi. 251. Petiolis exceptis glabra. Pinnæ 12–14-jugæ; foliola 40–50-juga, oblonga, obtusiuscula, 2 lin. longa, subtus pallida. Inflorescentia semipedalis, terminalis, aphylla, glaberrima, apice bracteis 3–4 lin. longis comosa, basi ebracteata. Capitula breviter pedunculata, pauciflora. Flores pedicellati, glabri. Calyx ⅔ lin., corolla vix 3 lin. longa. Legumen ignotum.

Hab. Tropical America: Surinam, in mountainous woods near the river Mariepastor-kreek, *Kegel*, n. 1465 (*Miquel*).

I have not seen this plant. It may possibly be more nearly allied to *C. bella* than to the two following species.

98. C. Houstoni, *Benth.! in Hook. Journ. Bot.* ii. 139; *Lond. Journ.* iii. 111. Ferrugineo-pubescens. Pinnæ 7–11-jugæ; foliola 30-50-juga, oblongo-linearia, subfalcata, 3–4 lin. longa. Capitula pauciflora, breviter pedunculata, longe racemosa. Flores

adpresso-villosi, breviter pedicellati. Calyx latus, ad 2 lin., corolla 4–5 lin. longa. Legumen sub-4-pollicare, ¾ poll. latum, crassum, dense villosissimum.

Mimosa Houstoni, Lher. Sert. Angl. 30; Banks, Rel. Houst. t. 26.
Acacia Houstoni, Willd. Spec. iv. 1062; Bot. Reg. t. 98.
Inga Houstoni, DC. Prod. ii. 442.
Acacia metrosideriflora, Schlecht. Linnæa, xii. 567.

Hab. Tropical America: Mexico, about Vera Cruz and Jalapa.

Scarcely to be distinguished from *C. grandiflora* by the fewer pinnæ, rather larger leaflets and flowers, and perhaps by a broader more densely villous pod.

It has been usual to add to the synonyms that of *Gleditschia inermis*, Linn. Spec. 1509, which, however, is scarcely correct. Linnæus took up the name and diagnosis from Duhamel, who had thus designated the thornless variety of *Gleditschia triacanthos*: but he (Linnæus) unfortunately added references to two widely different plants:—first to Plukenet's figure, t. 123. f. 3, named by Lamarck *Gleditschia javanica*, and taken up by DeCandolle as *Acacia javanica*, although nothing is known of it besides the foliage of a young seedling; from this source Linnæus appears to have taken his *habitat* and short description. The other reference is to Miller's excellent figure (Ic. t. 5), which indeed represents the *C. Houstoni*, but can only have been quoted by Linnæus at second hand, or through some inadvertence or mistake in copying.

99. C. GRANDIFLORA, *Benth.! in Hook. Journ. Bot.* ii. 139; *Lond. Journ.* iii. 111. Ferrugineo- v. subrufescenti-pubescens. Pinnæ 15–25-jugæ; foliola 30–60-juga, oblongo-linearia, obtusiuscula, 2–2½ lin. longa. Capitula pauciflora, breviter pedunculata, longe racemosa. Flores adpresso-villosi v. glabrescentes, breviter pedicellati. Calyx ad 1½ lin., corolla 3–4 lin. longa. Legumen 3–4-pollicare, 6–8 lin. latum, crassum, villosum.

Mimosa grandiflora, Lher. Sert. Angl. 30.
Acacia grandiflora, Willd. Spec. iv. 1074; Colla, Hort. Ripul. t. 9.
Inga anomala, Kunth! Mim. 70, t. 22.
Acacia callistemon, Schlecht. Linnæa, xii. 568.
Calliandra Kunthii, Benth. in Hook. Journ. Bot. ii. 139; Lond. Journ. iii. 112.

Hab. Tropical America: Mexico and Guatemala, sent by numerous collectors.

100. C. PARVIFLORA, *Benth.! in Hook. Lond. Journ.* iii. 112. Pubescens. Pinnæ 12–25-jugæ; foliola 30–40-juga, linearia, conferta, vix lineam longa. Capitula minima, pauciflora, paniculata, paniculis ramulis pedunculisque filiformibus. Flores sessiles, glabri. Calyx ¼ lin., corolla ½–¾ lin. longa. Stamina 10–12. Legumen crassum, lignosum, puberulum, 2½-pollicare, 4 lin. latum.

Acacia pachyloma, Mart.! Herb. Fl. Bras. n. 1108.

Hab. Tropical America: Brazil, prov. Minas Geraes, Goyaz, and Mattogrosso; Bolivia.

The habit and foliage are those of *Mimosa microcephala*, the flowers and fruit totally different.

XXIII. ALBIZZIA, *Durazz.*

Benth. et Hook. Gen. Pl. i. 596.

The species with large leaflets are very difficult to distinguish, without the fruit, from corresponding species of *Pithecolobium*; and F. Mueller proposes to unite the two genera under the name of *Albizzia*, which has the right of priority: but the differences in fruit are generally so strongly marked as to have induced most botanists to place the *Albizziæ* under *Acacia*, and the *Pithecolobia* under *Inga*. The only approach in the pod of the two genera is between *Pithecolobium*, sect. *Ortholobium*, and *Albizzia lophantha* and *montana*, groups which are in all other respects very widely separated.

The peculiar hard infrafoliaceous hooks or prickles, sometimes reduced to conical tubercles, observable in four species (*A. pedicellata, A. Millettii, A. rufa,* and *A. macrophylla*), appear to be rather more than epidermal, but require further observation on the living tree.

Sectio 1. Lophantha.

Flores in spicis cylindraceis v. elongatis conferti v. dissiti.

Series 1. Platyspermæ. *Species Austro-Caledonicæ, seminibus ubi nota planissimis late orbiculatis.*

1. A. Paivana, *Fourn. in Ann. Sc. Nat.* ser. 4, xv. 172. Scandens, glabra. Pinnæ 1-jugæ; foliola 2–3-juga, longe petiolulata, ovali-oblonga, obtusa, 3–8-pollicaria. Spicæ interruptæ, 6–10-pollicares. Flores sessiles, glabri. Calyx latus, linea brevior. Corolla 3–3½ lin. longa. Legumen ignotum.

Hab. New Caledonia, *Vieillard*, n. 420.

I refer this to Fournier's species on the authority of Vieillard's specimens, in which, however, the leaflets are fully twice as large as those described by Fournier; and the flowers are sessile, not pedicellate.

2. A. obovata, *Benth.*, sp. n. Ferrugineo-tomentella, foliis glabrescentibus. Pinnæ 1-jugæ; foliola 2–3-juga, sessilia, oblique obovata v. ovato-oblonga, obtusissima, læte virentia, 2–3-pollicaria. Spicæ elongatæ, interruptæ. Flores sessiles, ferrugineo-pubescentes. Corolla calyce vix duplo longior. Legumen ad 8 poll. longum, fere pollicem latum.

Hab. New Caledonia, *Vieillard*, nn. 418, 2516; *Deplanche*, n. 347; *Pancher, Montrouzier, Balansa.*

Ramuli juniores petioli et inflorescentia pube v. tomento brevi ferruginei. Foliola prima juventute pariter vestita, mox glabrescentia. Petiolus communis ½–1-pollicaris; pinnarum rhaches 1–1½ poll. longæ. Glandulæ parvæ. Foliola basi valde inæquilatera, costa cæterum subcentrali pennivenia et tenuiter venulosa. Spicarum rhaches cum pedunculo 6–8-pollicares. Flores in parte superiore interrupte fasciculati. Calyx campanulatus, 5-dentatus, 2–2½ lin. longus. Corolla vix 4 lin. longa, latiuscula. Legumen basi et apice breviter contractum, valvis membranaceo-coriaceis, minute puberulis, tenuiter reticulatis.

3. A. fulgens, *Benth. in Hook. Lond. Journ.* iii. 85. Subglabra. Pinnæ 2–4-jugæ; foliola 3–4-juga, ex ovato oblongo-rhombea, basi angustata, subsessilia, 1–2-pollicaria. Spicæ 2–4-pollicares, breviter pedunculatæ. Flores sessiles, glabri. Calyx ½ lin., corolla ad 3 lin. longa, angusta. Legumen subsessile, 5–6-pollicare, 6–7 lin. latum, valvis glabris reticulatis.—*Fourn. in Ann. Sc. Nat.* ser. 4, xv. 173.

Acacia fulgens, Labill. ! Sert. Austr. Caled. 68, t. 67.

A. cyclosperma, DC. Prod. ii. 456.

Albizzia rivularis, Fourn. l. c. 172, ex char.

Hab. New Caledonia, *Labillardière, Vieillard*, n. 421, 423, 424.

Labillardière's own specimens vary in the number of pinnæ, 2, 3, or 4, as well as in the breadth and precise shape of the leaflets; and in both these respects Fournier's *A. rivularis* must be intermediate between Labillardière's and Vieillard's extremes. I can trace no other distinctive character in his elaborate diagnosis. De Candolle's *Acacia cyclosperma* was described from a specimen in Herb. Delessert, which Ventenat had probably from Labillardière. The seeds are about ¾ in. broad, as in most of the New-Caledonian species.

4. A. LENTISCIFOLIA, *Benth.*, sp. n. Ferrugineo-tomentella, foliis mox glabrescentibus. Pinnæ 3–4-jugæ; foliola 6–8-juga, late oblonga, obtusa, coriacea, nitida, 6–9 lin. longa. Spicæ rigidulæ, 2-pollicares. Flores sessiles, minute tomentelli. Calyx ¾ lin., corolla campanulata 1½ lin. longa. Legumen ignotum.

Hab. New Caledonia.

Partes novellæ et inflorescentia tomento minuto ferrugineæ, folia adulta glabra. Petiolus communis rigidulus, 1–1½-pollicaris; pinnarum rhaches tenuiores, 1–2-pollicares. Glandulæ inter pinnas parvæ, scutellatæ. Foliola omnia opposita, sessilia, ultima sæpius basi inæquilatera et interdum obovali-oblonga, cætera sæpius subregulariter oblonga, ad 3 lin. lata, costa centrali tenuiter venulosa, utrinque nitida, subtus vix pallidiora. Spicæ in specimine nostro 1½-pollicares, densifloræ, pedunculo 6–9 lin. longo, rhachique crassiusculis ferrugineo-tomentellis. Corolla latiuscule campanulata. Stamina corolla subduplo longiora, basi breviter monadelpha et ima basi cum corolla connata.

5. A. GRANULOSA, *Benth. in Hook. Lond. Journ.* iii. 85. Puberula, foliolis glabratis. Pinnæ 4–7-jugæ; foliola 10–14-juga, rhombeo-ovata v. oblonga, basi valde obliqua, latere interiore subauriculata, submembranacea, 4–6 lin. longa, sæpe alterna. Spicæ tenues, 3–4-pollicares. Flores sessiles, subglabri. Calyx ¾ lin., corolla 2½ lin. longa, angusta. Legumen rectum v. curvulum, 6–8-pollicare, 6–8 lin. latum.—*Fourn. in Ann. Sc. Nat.* ser. 4, xv. 173.

Acacia granulosa, Labill.! Sert. Austr. Caled. 67, t. 66.

Hab. New Caledonia, *Labillardière*, *Vieillard*, n. 416.

6. A. SUBFALCATA, *Benth.*, sp. n. Rufo-tomentella, foliis glabrescentibus. Pinnæ 2–4-jugæ; foliola 6–12-juga, falcato-lanceolata, basi valde inæquilatera, membranacea, nitidula, 6–9 lin. longa. Spicæ elongatæ, interruptæ. Calyx pubescens, 1½ lin. longus. Corolla ignota. Legumen sub-8-pollicare, leviter falcatum, 6–8 lin. latum, ferrugineo-tomentellum, demum glabratum, reticulatum.

Hab. New Caledonia, *Pancher*.

Foliorum petiolus communis tenuis, semipedalis v. longior. Pinnæ 2–3-pollicares, ut in *A. fulgente* per paria distantes. Glandulæ parvæ v. obsoletæ. Foliola sæpius glabra, falcato-acuminata, costa curva lateri exteriori parallela, latere interiore infra medium subangulato-dilatato. Spicæ fructiferæ rhachis crassiuscula, rufo-tomentella, 4–5-pollicaris. Calyces qui supersunt iis *A. fulgentis* multo majores. Nec corollas nec stamina vidi.

From a hasty glance at the rich New-Caledonian collections lately received at the Jardin des Plantes, there appeared to me to be two or three additional new species of *Albizzia*, which, however, on my recent visit to Paris I had not time to examine and describe. When these are carefully worked up, it is probable that some extension also will have to be given to the characters by which some of the above-described species have been distinguished.

Series 2. Pachyspermæ. *Australienses v. Javanæ, seminibus ovali-oblongis crassiusculis.*

7. A. LOPHANTHA, *Benth.! in Hook. Lond. Journ.* iii. 86. Velutino-puberula. Pinnæ 8–10-jugæ; foliola 20–40-juga, linearia, obtusiuscula, 3–4 lin. longa, glabra v. subtus sericeo-puberula, costa valde excentrica. Spicæ cylindraceæ, 1–3-pollicares. Flores distincte pedicellati. Calyx ad 1 lin., corolla 2½–3 lin. longa. Legumen 2½–4 poll. longum, 6–9 lin. latum, glabrum.—*Benth. Fl. Austral.* ii. 421.

Acacia lophantha, Willd. Spec. iv. 1070; Bot. Reg. t. 361; Lodd. Bot. Cab. t. 716; Bot. Mag. t. 2108.
Mimosa lophantha, Pers. Syn. ii. 264.
Mimosa distachya, Vent. Hort. Cels. t. 20.
Mimosa elegans, Andr. Bot. Rep. t. 563.
Acacia insignis, Hoffm. Verz. ex DC.
Hab. Extratropical South-west Australia.

8. A. MONTANA, *Benth.! in Pl. Jungh.* i. 267. Ferrugineo-villosa. Pinnæ 7–12-jugæ; foliola 20–40-juga, oblongo-linearia, obtusiuscula, 3–4 lin. longa, glabra v. subtus sericeo-pilosa, costa valde excentrica. Spicæ cylindraceæ, subinterruptæ, 2–3-pollicares. Flores brevissime pedicellati, uti legumen omnino *A. lophanthæ*. *Miq. Fl. Ind. Bat.* i. pars i. 29.

Inga montana, Jungh. Reise, 288, ex Miq.
Acacia montana, Jungh.! in Tijdschr. Nat. Wet. i. 246.
Acacia saltuum, Jungh.! in Bot. Zeit. 1845, 703.
Acacia vulcanica, Korth. Hort. Bogor. ex Flora, 1847, 705.
Albizzia Benthamiana, Blume in Miq. Fl. Ind. Bat. i. pars i. 30, ex char.
Hab. Tropical Asia: mountains of Java.

This is scarcely to be distinguished from *A. lophantha* except by the denser, more ferruginous indumentum, and the less distinctly pedicellate flowers, besides the totally different geographical station.

Sectio 2. EUALBIZZIA.

Flores in capitulis globosis v. paucifloris sessiles v. pedicellati. Staminum tubus inclusus v. corollam breviter excedens. Semina sæpius (an semper?) planissima orbiculata.

Series 1. Macrophyllæ. *Pinnæ* 1–4-*jugæ*. *Foliola ampla, majora sesquipollicem excedentia.*

9. A. GLOMERIFLORA, *S. Kurz in Journ. Asiat. Soc. Beng.* xlii. 74. Puberula, glabrescens. Pinnæ 1-jugæ; foliola 3- rarius 2-juga, oblongo- v. subrhombeo-lanceolata, breve mucronato-acuminata, 1–2-pollicaria, tenuiter et rigide coriacea. Pedunculi tenues, fasciculati, paniculati. Flores sessiles, pubescentes. Calyx vix $\frac{1}{2}$ lin., corolla $1\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. Tropical Asia: Martaban.

I have not seen this species. It must be very near *A. lucida*, but with smaller leaflets, much smaller flowers, and the whole more pubescent.

10. A. LUCIDA, *Benth.! in Hook. Lond. Journ.* iii. 86. Glabra v. pube rara conspersa. Pinnæ 1-jugæ; foliola sæpius 2-juga, ovali-oblonga, acuminata, pennivenia, nitidula, majora 2–4-pollicaria. Pedunculi tenues, fasciculati, paniculati. Flores sessiles glabriusculi v. puberuli. Calyx $\frac{3}{4}$ lin., corolla ad 3 lin. longa. Legumen 8–10-pollicare, 1–$1\frac{1}{2}$ poll. latum, glabrum, nitidulum, vix venulosum.

Mimosa lucida, Roxb.! Fl. Ind. ii. 344.
Inga lucida, Wall.! Cat. Herb. Ind. n. 5267, excl. litt. B et F pro parte.
Hab. Tropical and subtropical Asia: Bengal, Silhet, and North-west India.

The Javan specimens I referred to this species in Pl. Jungh. are not in fruit, and on further comparison appear more probably to belong to *Pithecolobium bigeminum*.

11. A. JAUBERTIANA, *Fourn. in Ann. Sc. Nat.* ser. 4, xiv. 381. Glabra. Pinnæ 1-jugæ; foliola 1–3-juga, longiuscule petiolulata, late ovata, obtusissima, coriacea, nitida, 1½–3-pollicaria. Pedunculi elongati. Flores ignoti. Legumen 3–4-pollicare, basi breviter contractum, 1–1½ poll. latum.

Hab. Madagascar: Ambongo district, *Pervillé*.

12. A. SAPONARIA, *Blume, in Miq. Fl. Ind. Bat.* i. pars i. 19. Ferrugineo-tomentella, foliis demum glabratis. Pinnæ 1–2-jugæ; foliola 2–4-juga, petiolulata, oblique ovata v. subrhombea, obtusa, majora 2–5-pollicaria. Pedunculi fasciculati, paniculati. Flores sessiles, breviter ferrugineo-sericei. Calyx 1–1¼ lin. Corolla fere 3 lin. longa. Legumen subsessile, 3–4-pollicare, 1–1½ poll. latum, tenuiter transverse reticulato-venulosum.

Mimosa saponaria, Lour. Fl. Cochinch. 653.

Inga saponaria, Willd. Spec. iv. 1008.

Hab. Tropical Asia: Malayan archipelago.

Willdenow and Loureiro's species was founded on Rumphius's description of his *Cortex saponarius*, Herb. Amb. iv. 131, accompanied by a rude unintelligible plate. The above character is derived partly from Miquel, partly from a Javan specimen of Teysmann's, communicated by Hasskarl. Whether all belong to one species is as yet very uncertain.

13. A. TOMENTELLA, *Miq.! Fl. Ind. Bat.* i. pars i. 20. Ferrugineo-tomentella. Pinnæ 2–4-jugæ; foliola 3–6-juga, rhombeo-elliptica, oblique ovata v. obovata, acutiuscula, majora 1½–2-pollicaria, utrinque sparse puberula, subtus pallida. Pedunculi tenues, fasciculati, paniculati. Flores sessiles, sericeo-pubescentes. Calyx 1 lin., corolla angusta fere 4 lin. longa. Legumen ignotum.

Hab. Tropical Asia: Malayan archipelago, Java.

14. A. ROTUNDATA, *Blume in Miq. Fl. Ind. Bat.* i. pars i. 20. Ab *A. tomentella*, cui maxime affinis, differt indumento haud sericante magis hirtello, foliolis potius rotundatis, pilis paginæ superioris sæpe substellatis, tubo stamineo non exserto (*Miquel*).

Hab. Tropical Asia: New Guinea.

I have not seen this species; nor have I observed stellate hairs on any *Albizzia*.

15. A. SALAJERIANA, *Miq. Fl. Ind. Bat.* i. pars i. 21. Tenere puberula. Pinnæ 2-jugæ; foliola 2–3-juga, rhombeo-elliptica v. subovata, subacuta, ¾–1¾ poll. longa, utrinque tenere pubescentia. Capitula pedunculata, paniculata, pauciflora. Flores sessiles, pubescentes. Corolla 1½ lin. longa. Calyx multo brevior. Legumen sessile, 8-pollicare, 1¼ poll. latum (*Miquel*).

Hab. Tropical Asia. Salajen island, S. of Celebes, *Zollinger*, n. 1081.

I have seen no specimen.

Series 2. Obtusifoliæ. *Pinnæ pauci-* (2–6- *rarius*, 8–9-)*jugæ. Foliola plurijuga, ovata v. oblonga, obtusa, sæpius* ½–1½*-pollicaria* (*in* A. versicolore *et* A. glabrescente *usque ad* 2-*poll.*), *basi breviter v. parum inæquilatera, costa cæterum subcentrali.*

* *Flores in capitulo pedicellati. Pedunculi axillares v. breviter racemosi. Corollæ sæpius ad* 3 *lin. longæ v. longiores* (*excepta* A. glabrescente). *Foliola pleraque pollicaria v. longiora.*

16. A. Lebbek, *Benth. in Hook. Lond. Journ.* iii. 87. Glabra v. minute puberula. Pinnæ 2–4-jugæ, foliola 4–9-juga, oblique ovali-oblonga, obtusissima, subsessilia, basi deorsum latiora, $\frac{3}{4}$–2-pollicaria. Pedunculi longiusculi, fasciculati, subracemosi. Flores pubescentes v. glabriusculi, breviter pedicellati. Calyx $1\frac{1}{2}$–2 lin., corolla ad $3\frac{1}{2}$ lin. longa. Legumen $\frac{1}{2}$–1-pedale, 1–$1\frac{1}{2}$ poll. latum, glabrum.—*Oliv. Fl. Trop. Afr.* ii. 358; *Bedd. Fl. Sylv.* t. 53.

Mimosa Lebbek, Linn. Spec. 1503.
Acacia Lebbek, Willd. Spec. iv. 1066.
Mimosa speciosa, Jacq. Ic. Rar. i. 19, t. 198.
Acacia speciosa, Willd. Spec. iv. 1066.
Mimosa Sirissa, Roxb.! Fl. Ind. ii. 544.
Acacia Sirissa, Ham.! in Wall. Cat. Herb. Ind. n. 5265.
Acacia macrophylla, Bunge! Enum. Pl. Chin. Bor. 20.
Albizzia latifolia, Boiv. in Encycl. xix. Siècl. ii. 32.
Inga borbonica, Hassk. Hort. Bogor. 291.
Inga leucoxylon, Hassk. in Flora, 1842, Beibl. ii. 102, Hort. Bogor. 292.
Mimosa flexuosa, Rottl. ex W. et Arn. Prod. Fl. Penins. 275.

Hab. Tropical and temperate Asia and Africa from Senegal and Egypt to Burmah, China, and Japan; but in many places planted. Introduced also into the West Indies and South America.

This species, as observed by Fournier, differs from the three following African ones in the leaflets having the lower side dilated at the base instead of the upper side; but the character can scarcely be carried further, for in the subsequent species, with more numerous leaflets, the dilatation is often equal, or sometimes rather broader on the upper, sometimes on the lower side, in different parts of the same pinna.

Acacia Habbas, Link, Enum. Hort. Berol. ii. 444, is described as being allied to *A. Lebbek*, with the leaflets twice as large. I know of no such Egyptian *Mimosea*, and it is certainly not the *Mimosa Habbas* of Delisle, which is *Mimosa asperata.*

17. A. versicolor, *Welw. in Oliv.! Fl. Trop. Afr.* ii. 359. Tomentoso-pubescens. Pinnæ 2–4-jugæ; foliola 3–6-juga, brevissime petiolulata, oblique obovali-elliptica, obtusa, basi sursum latiora, majora $1\frac{1}{2}$–2-pollicaria. Pedunculi fasciculati, longiusculi. Flores breviter pedicellati, pubescentes. Calyx $1\frac{1}{2}$–3 lin., corolla 5–6 lin. longa. Legumen "4–10-pollicare, $1\frac{1}{2}$–2 poll. latum."

Hab. Southern tropical Africa.

18. A. glabrescens, *Oliv.! Fl. Trop. Afr.* ii. 357. Minute puberula, mox glabrata. Pinnæ 1–2-jugæ; foliola 4–6-juga, breviter petiolulata, oblique oblongo-rhomboidea, obtusa, basi sursum latiora, 1–2-pollicaria. Pedunculi pollicares, ad apices ramorum breviter fasciculato-racemosi. Flores puberuli, pedicellati. Calyx 1 lin., corolla $2\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. South-eastern tropical Africa.

Foliola fere *Macrophyllarum* sed numerosiora et sæpe minora. Inflorescentia *A. proceræ* accedit, sed flores longiuscule pedicellati.

19. A. RHOMBIFOLIA, *Benth.! in Hook. Lond. Journ.* iii. 87. Puberula v. folia glabrata. Pinnæ 2–3-jugæ; foliola 3–6-juga, obovali-oblonga v. rhombea, obtusa, reticulata, basi sursum latiora, majora 1–1½-pollicaria. Flores glabri, pedicellati. Calyx 1½ lin., corolla ad 3 lin. longa. Legumen ignotum.—*Oliv.! Fl. Trop. Afr.* ii. 358.

Mimosa glaberrima, Schum. et Thonn.! Beskr. Pl. Guin. 321.

Albizzia glaberrima, Benth.! in Hook. Lond. Journ. ii. 88.

Hab. Western tropical Africa.

Thonning's specimen, which I saw in Vahl's herbarium at Copenhagen in 1846, appeared to me to differ in no respect from the other Senegambian ones except in being more glabrous; the young branches and petioles are pubescent, and are so described by Thonning, notwithstanding the name.

** *Flores in capitulo longiuscule pedicellati. Capitula in racemum subcorymbosum disposita. Foliola infrapollicaria.*

20. A. RETUSA, *Benth.! in Hook. Lond. Journ.* iii. 90. Glabra v. inflorescentia tenuiter cano-puberula. Pinnæ 4–6-jugæ; foliola 6–10-juga, obovato-oblonga, obtusa, ½–¾-pollicaria. Capitula pedunculata, subcorymbosa. Flores puberuli, pedicellati. Calyx 1 lin., corolla 3 lin. longa. Staminum tubus subexsertus. Legumen ignotum.

Hab. Tropical Asia: Philippine Islands, *Cuming*, nn. 1223 and 1593.

21. A. PEDICELLATA, *Baker! in Hook. Fl. Ind. ined.* Puberula. Aculei (v. spinæ?) solitarii, infrafoliacei, crassi, uncinati. Pinnæ 4–10-jugæ; foliola 15–20-juga, late oblonga, obtusissima, 6–9 lin. longa, glabra. Capitula pedunculata, subcorymbosa. Flores adpresse villosi, in rhachi lineari longiuscule pedicellati. Calyx 1½ lin., corolla fere 3 lin. longa. Legumen 8-pollicare, 2–2½ poll. latum, avenium.

Hab. Tropical Asia: Malacca, *Maingay.*

Arbor procera. Aculei (an revera epidermales?) iis *A. rufæ* aut *A. Millettii* similes. Pedunculi seu rami floriferi aphylli, crassi, ferrugineo-pubescentes, 6–8-pollicares, apicem versus pedunculos plurimos fasciculatos ferentes, specimina tamen inflorescentiam imperfectam ostendunt, et quoad folia haud bona. Capitulorum seu spicarum rhachis 1–1½ lin. longa, nec ut in plerisque speciebus convexa tantum.

*** *Flores in capitulo brevissimime pedicellati v. subsessiles, corolla 3–5 lin. longa. Pedunculi monocephali, axillares, ad nodos fasciculati v. ad apices ramorum breviter racemosi.*

22. A. FERRUGINEA, *Benth. in Hook. Lond. Journ.* iii. 88. Ferrugineo- v. subcanescenti-pubescens. Pinnæ 3–6-jugæ; foliola 8–20-juga, oblonga, obtusa, utrinque molliter pubescentia, 6–9 lin. longa. Pedunculi axillares, subgemini. Flores breviter pedicellati, villosi. Calyx fere 2 lin., corolla 4–5 lin. longa. Legumen 4–6-pollicare, ¾–1 poll. latum.—*Oliv. Fl. Trop. Afr.* ii. 361.

Inga ferruginea, Guill. et Perr.! Fl. Seneg. i. 236.

Acacia malacophylla, Steud.! in Schimp. Pl. Abyss. quoad specimina fructifera, n. 521.

Inga malacophylla, A. Rich. Fl. Abyss. i. 235, pro parte.

Albizzia malacophylla, Walp. Ann. ii. 457; Fourn. in Ann. Sc. Nat. ser. 4. xiv. 376.

Hab. North tropical Africa: Senegambia and Abyssinia.

The Senegambian plant being only known in flower, and the Abyssinian one in fruit, their identity is perhaps not yet sufficiently established, although I can discover no character to separate them.

23. A. PALLIDA, *Fourn.! in Ann. Sc. Nat.* ser. 4, xiv. 375. Pallide pubescens. Pinnæ 5–7-jugæ; foliola 8–20-juga, oblonga, obtusa, 6–9 lin. longa, pallida, glabrescentia. Pedunculi axillares, subgemini. Flores brevissime pedicellati, sericeo-tomentelli. Calyx $1\frac{1}{2}$ lin., corolla vix 3 lin. longa. Legumen ignotum.—*Oliv. Fl. Trop. Afr.* ii. 359.

Acacia malacophylla, Steud.! in Schimp. Pl. Abyss. quoad specimina florida, n. 1578.

Inga malacophylla, A. Rich. Fl. Abyss. i. 235, pro parte.

Hab. North-east tropical Africa: Abyssinia.

Certainly very closely allied to *A. ferruginea,* but appears to be distinct in indumentum, rather more numerous pinnæ and leaflets, and smaller flowers.

24. A. CORIARIA, *Welw. in Oliv. Fl. Trop. Afr.* ii. 360. Ferrugineo-pubescens v. mox glabrescens. Pinnæ 3–6-jugæ; foliola 6–11-juga, breviter petiolulata, elliptico-oblonga, obtusa, $\frac{1}{2}$–1-pollicaria, glabrata. Pedunculi subfasciculati, axillares v. breviter racemosi. Flores sessiles, puberuli. Calyx 2 lin. longus, sæpe basi circumscissus. Corolla 4 lin. longa. Legumen 5–8-pollicare, 1–$1\frac{1}{2}$ poll. latum.

Hab. South-west tropical Africa, *Welwitsch.*

I have not seen this or the following species, and have taken their characters from Oliver's 'Flora.'

25. A. ANGOLENSIS, *Welw. in Oliv. Fl. Trop Afr.* ii. 360. Breviter ferrugineo-pubescens. Pinnæ 3–5-jugæ; foliola 5–13-juga, sessilia, oblonga, obtusa, 6–9 lin. longa, utrinque pubescentia. Pedunculi axillares, breviter racemosi. Flores pubescentes, subsessiles. Calyx 2 lin., corolla 4 lin. longa. Legumen 9-10-pollicare, $1\frac{1}{2}$–2 poll. latum.

Hab. South-west tropical Africa, *Welwitsch.*

26. A. ANTHELMINTICA, *A. Brongn. in Bull. Soc. Bot. Fr.* vii. 902. Glabra v. junior vix minute puberula. Pinnæ 2–3- (rarius 1–4-)jugæ; foliola 2–3- (rarius 4–5-)juga, obovata v. suborbiculata, obliqua, tenuia, pleraque $\frac{1}{2}$–1-pollicaria. Pedunculi axillares v. ad nodos vetustos breves fasciculati. Flores glabri, brevissime pedicellati. Calyx 1–$1\frac{1}{4}$ lin., corolla 3 lin. longa. Legumen 2–6-pollicare, 4–9 lin. latum.—*Oliv. Fl. Trop. Afr.* ii. 357.

Besenna anthelmintica, Fourn. Thèse Inaug. cum ic.; A. Rich.! Fl. Abyss. i. 253.

Albizzia floribunda, Kotschy, in Schweinf. Rel. Kotsch. 5, t. 4.

Hab. East tropical Africa: Abyssinia, and Cordofan to the Zambesi.

**** *Flores sessiles v. brevissime pedicellati, parvi, corolla* 2 *v. rarius fere* 3 *lin. longa. Pedunculi tenues, fasciculati, in inflorescentia aphylla paniculiformi sæpius numerosi, breviusculi* (Parvifloræ).

27. A. CANESCENS, *Benth.! Fl. Austral.* ii. 423. Sericeo- v. canescenti-pubescens. Pinnæ 2–3-jugæ; foliola 5–8-juga, oblique obovata, obtusa, $\frac{3}{4}$–$1\frac{1}{2}$-pollicaria, pinnarum inferiorum pauciora minora. Inflorescentia paniculiformis, foliis brevior. Flores sessiles, sericeo-pubescentes. Calyx 1 lin., corolla vix $2\frac{1}{2}$ lin. longa. Legumen 8–10-pollicare, $1\frac{1}{2}$–$2\frac{1}{2}$ poll. latum.

Hab. Tropical North-east Australia.

28. A. PROCERA, *Benth.! in Hook. Lond. Journ.* iii. 89. Sericeo-puberula, demum glabrescens. Pinnæ subtrijugæ; foliola petiolulata, 6–8-juga, oblique ovali-oblonga,

obtusa, subpollicaria, costa excentrica a margine distante. Inflorescentia paniculiformis, foliis brevior. Flores sessiles, puberuli. Calyx 1 lin., corolla vix 2 lin. longa. Legumen 5–7-pollicare, ¾–1 poll. latum.—*Benth. Fl. Austral.* ii. 422; *Brand. For. Fl.* 175, t. 26.

Mimosa procera, Roxb. Corom. Pl. ii. 12. t. 121.

Acacia procera, Willd. Spec. iv. 1063.

Mimosa elata, Roxb.! Fl. Ind. ii. 546.

Acacia elata, Grah.! in Wall. Cat. Herb. Ind. n. 5233.

Mimosa coriaria, Blanco, Fl. Felip. 734, ed 2, 506? ex descr.

Hab. Tropical Asia: eastern provinces of India, Burmah, the Archipelago, and apparently the same on the north coast of Australia.

Adenanthera falcataria, Linn. Spec. 550, *A. falcata,* Willd. Spec. ii. 550, taken up from Rumphius's figure, Herb. Amb. iii. t. 111, is probably an *Albizzia* nearly allied to, if not identical with, *A. procera.*

29. A. ODORATISSIMA, *Benth.! in Hook. Lond. Journ.* iii. 88. Minute puberula. Pinnæ 3–8-jugæ; foliola 8–25-juga, oblique oblonga, obtusa, 6–9 lin. longa, pube minima conspersa v. canescentia, rarius glabra, costa sæpius excentrica sed a margine distante. Inflorescentia paniculiformis. Flores sessiles, pubescentes. Calyx vix semilineam excedit; corolla fere 3 lin. longa. Legumen semipedale et longius, 1–1½ poll. latum, glabrum v. minute tomentellum.

Mimosa odoratissima, Roxb.! Corom. Pl. ii. 12. t. 120.

Acacia odoratissima, Willd. Spec. iv. 1063.

Albizzia micrantha, Boiv. in Encycl. xix. Siècl. ii.

Hab. Tropical and subtropical Asia: Ceylon, the Indian peninsula, and North-west India.

Mimosa kalkora, Roxb. Fl. Ind. ii. 547, brought to the Botanic Garden, Calcutta, from Gualpara, and imperfectly described as to foliage only, may be a glabrous form of *A. odoratissima.*

30. A. QUARTINIANA, *Walp. Ann.* ii. 457. Folia et inflorescentia *A. odoratissimæ.* Flores ignoti. Legumen 6–10-pollicare, ¾–1 poll. latum.—*Oliv.! Fl. Trop. Afr.* ii. 359.

Inga quartiniana, A. Rich.! Fl. Abyss. i. 235.

Hab. North-east tropical Africa: Abyssinia, *Quartin-Dillon.*

As far as our specimen and the descriptions go, I am unable to distinguish this from some specimens of the East-Indian *A. odoratissima.*

31. A. ELLIPTICA, *Fourn. in Ann. Sc. Nat.* ser. 4. xiv. 374. Puberula. Pinnæ 8-jugæ; foliola 8–12-juga, elliptica, basi sursum dilatata, deorsum attenuata, costa obliqua, subtus pallide villosa. Pedunculi elongati, axillares, solitarii v. gemini. Calyx medium corollæ superans. Legumen 3–4-pollicare, pollicem latum, fere glabrum.

Hab. North-east tropical Africa: Abyssinia, *Schimper,* n. 1087.

I have seen no specimen. It is probably, like the preceding, very near *A. odoratissima.*

32. A. MILLETTII, *Benth.! in Hook. Lond. Journ.* iii. 89. Glabra v. minute puberula. Aculei crassi uncinati sub foliis solitarii sæpe adsunt. Pinnæ 3–6-jugæ; foliola 4–10-juga, obovato-oblonga, obtusa, obliqua, 6–9 lin. longa, utrinque glabra, costa subcentrali. Inflorescentia paniculiformis. Flores sessiles, glabriusculi. Calyx linea brevior, corolla vix 2 lin. longa. Legumen semipedale, 1¼ poll. latum.—*Benth. Fl. Hongk.* 102.

Mimosa corniculata, Lour. Fl. Cochinch. 651, ex descr.

Cæsalpinia lebbekoides, DC. ! Prod. ii. 483.

Hab. Tropical Asia : South China, Macao, and Hong Kong.

33. A. RUFA, *Benth. ! in Hook. Lond. Journ.* v. 101. Tomento rufo pubescens. Aculei crassi uncinati sub foliis solitarii sæpe adsunt. Pinnæ 4–6-jugæ ; foliola 8–12-juga, obovata v. obovato-oblonga, obtusa, obliqua, 6–8 lin. longa, appresse pilosa, costa subcentrali. Inflorescentia paniculiformis. Flores sessiles, villosi. Calyx linea brevior. Corolla vix 2 lin. longa. Legumen 4–6-pollicare, $1\frac{1}{4}$–$1\frac{1}{2}$ poll. latum, glabrum, glaucum.

Acacia rufa, Hassk. ! Hort. Bogor. 290.

Hab. Tropical Asia : Java.

***** *Species Australienses, pinnis* 1–2*-jugis, petiolo brevi. Capitula in axillis pedunculata. Flores parvi, sessiles, staminibus corolla haud duplo longioribus* (Brachystemones).

34. A. THOZETIANA, *F. Muell. ! in Benth. Fl. Austral.* ii. 422. Glabra v. junior cano-puberula. Pinnæ 1-jugæ ; foliola 2–3- rarius 4-juga, cuneato-oblonga v. late linearia, obtusissima, paris ultimi $\frac{1}{2}$–1-pollicaria, cætera multo minora. Flores minute cano-puberuli. Calyx fere lineam, corolla $1\frac{1}{2}$ lin. longa. Legumen 6–8-pollicare, $\frac{1}{2}$–$\frac{3}{4}$ poll. latum, coriaceum.

Acacia Thozetiana, F. Muell. ! Fragm. iv. 9.

Hab. North-east tropical Australia.

35. A. BASALTICA, *Benth. ! Fl. Austral.* ii. 422. Minute ferrugineo-puberula. Pinnæ 1–2-jugæ ; foliola 5–10-juga, oblonga v. fere ovata, obtusissima, 2–3 lin. longa, coriacea, cano-puberula. Flores puberuli. Calyx 1 lin., corolla $1\frac{1}{2}$ lin. longa. Legumen ad 3 poll. longum, 4–5 lin. latum, coriaceum.

Acacia basaltica, F. Muell. ! in Journ. Linn. Soc. iii. 146.

Hab. North-east tropical Australia.

****** *Species Madagascarienses a me non visæ.*

36. A. PURPUREA, *Boiv. ex Fourn. in Ann. Sc. Nat.* ser. 4, xiv. 378. Glabra v. glaucescens. Pinnæ 2-jugæ ; foliola 3–5-juga, ovali-lanceolata, pollicaria. Pedunculi fasciculato-paniculati. Legumen fere pedale, 1–$1\frac{1}{2}$ poll. latum.

Hab. Islands of Comores and Nossi-Bé, *Boivin.*

37. A. BOIVINI, *Fourn. in Ann. Sc. Nat.* ser. 4, xiv. 378. Glabra. Pinnæ 2–4-jugæ ; foliola 4–5-juga, summa quadrangularia, $1\frac{1}{2}$-pollicaria, inferiora minora, rotundata, supra lucida. Pedunculi axillares. Flores glabri. Corolla calyce duplo longior. Legumen ignotum.

Hab. Madagascar, Gulf Diego-Suarez, *Boivin.*

38. A. VIRIDIS, *Fourn. in Ann. Sc. Nat.* ser. 4, xiv. 377. Pinnæ 8-jugæ ; foliola 5–9-juga v. numerosiora, basi inæqualiter truncata, glabra, infra pallida. Legumen 4-pollicare, obtusum.

Hab. Madagascar ? *Dupetit-Thouars.*

39. A. POLYPHYLLA, *Fourn. in Ann. Sc. Nat.* ser. 4, xiv. 372. Subferrugineo-tomen-

tosa. Pinnæ 25–30-jugæ; foliola permulta, linearia, parva, supra nigricantia, utrinque pubescentia. Legumen 6–7-pollicare, 2 poll. latum, longe stipitatum, ferrugineo-tomentosum.

Hab. Madagascar: Diego-Suarez, on the north coast, *Bernier*.

Series 3. Microphyllæ. *Pinnæ multijugæ. Foliola multijuga, parva* (1–3 *lin. longa*), *sæpius falcata, costa subcentrali.*

40. A. AMARA, *Boiv. in Encycl. XIX Siècl.* ii. Pubescens. Pinnæ 7–12-jugæ; foliola 20–40 juga, oblongo-linearia, recta v. subfalcata, obtusiuscula, 1½–3 lin. longa, puberula v. subsericea, costa subcentrali. Pedunculi ad nodos sæpius fasciculati. Flores sessiles, puberuli. Calyx 1 lin., corolla ad 2½ lin. longa. Legumen 5–8-pollicare, ¾–1½ poll. latum, tomentoso-puberulum v. glabratum.—*Oliv. Fl. Trop. Afr.* ii. 356.

Mimosa amara, Roxb.! Corom. Pl. ii. 13, t. 122.
Acacia amara, Willd. Spec. iv. 1074.
A. Wightiana, Grah.! in Wall. Cat. Herb. Ind. n. 5259.
A. Wightii, W. et Arn. Prod. Fl. Penins. 274.
Mimosa pulchella, Roxb. Fl. Ind. ii. 548.
Acacia nellyrenza, Grah.! in Wall. Cat. n. 5240.
A. sericocephala, Fenzl! in Flora, 1844, 312.
Albizzia sericocephala, Benth.! in Hook. Lond. Journ. iii. 91; Schweinf. Rel. Kotsch. 6, t. 5, 6.
Inga sericocephala; A. Rich. Fl. Abyss. i. 236.
Albizzia affinis, Fourn. in Ann. Sc. Nat. ser. 4, xiv. 371.

Hab. Tropical Asia and Africa: East-Indian peninsula, Cordofan, and Abyssinia.

41. A. MYRIOPHYLLA, *Benth.! in Hook. Lond. Journ.* iii. 90. Pubescens. Aculei crassi uncinati sub foliis solitarii sæpe adsunt. Pinnæ 15–18-jugæ; foliola 20–50-juga, oblongo-linearia, subfalcata, 1–2 rarius 3 lin. longa, rigidula, costa subcentrali. Pedunculi fasciculati, paniculati. Flores sessiles, puberuli, parvi. Calyx ¼ lin., corolla ad 2 lin. longa. Legumen 4–6-pollicare, ¾–1 poll. latum.

Mimosa microphylla, Roxb. Fl. Ind. ii. 549.
Acacia myriophylla, Grah.! in Wall. Cat. Herb. Ind. n. 5242.
A. foliolosa, Grah.! *l. c.* n. 5241.

Hab. Tropical and subtropical Asia: eastern provinces of India.

42. A. HYPOLEUCA, *Oliv.! Fl. Afr. Trop.* ii. 356. Pubescens. Pinnæ 10–13-jugæ; foliola ad 20-juga, lineari-falcata, acuta, 2–3 lin. longa, subtus pallida v. canescentia, costa parum excentrica. Pedunculi in axillis superioribus fasciculati. Flores sessiles, pubescentes. Calyx 1 lin., corolla 2–2½ lin. longa. Legumen ignotum.

A. pallida, Harv. in Fl. Cap. ii. 284.

Hab. Southern tropical Africa: near Lake Ngami, *M'Cabe*.

Series 4. Falcifoliæ. *Pinnæ 2- multijugæ. Foliola 10- multijuga, plus minus falcata, sæpius acuta, costa valde excentrica v. margini superiori contigua. Pedunculi fasciculati, axillares v. breviter racemosi.*

The first two species have the midrib more distant from the margin than the others, and are as it were intermediate between *A. odoratissima* and *A. Julibrissin*.

43. A. SCHIMPERIANA, *Oliv.! Fl. Trop. Afr.* ii. 359. Glabra v. leviter puberula.

Pinnæ 4–5-jugæ; foliola 11–20-juga, oblongo-subfalcata, oblique acuta, 5–8 lin. longa, costa valde excentrica a margine tamen distante. Pedunculi axillares. Flores ignoti. Legumen subsemipedale, 1–1$\frac{1}{3}$ poll. latum, longiuscule stipitatum.

Hab. North-east tropical Africa: Abyssinia.

44. A. LEBBEKOIDES, *Benth.! in Hook. Lond. Journ.* iii. 89. Tomentoso-pubescens, mox glabrescens. Pinnæ 3–8-jugæ; foliola 20–30-juga, subfalcato-oblonga, acutiuscula, 6–9 lin. longa, coriacea, glabra, supra nitidula, subtus glaucescentia, costa valde excentrica a margine tamen distante. Capitula subpaniculata. Flores parvuli, subsessiles, appresse pubescentes. Legumen breviter stipitatum, 4–6-pollicare, $\frac{3}{4}$–1 poll. latum.

Acacia lebbekoides, DC. Prod. ii. 467; Dcne., Herb. Tim. Descr. 133.

Hab. Tropical Asia: Java, Timor.

When I saw this plant in De Candolle's Herbarium I thought it might be a variety of *A. odoratissima*; but on comparing the specimens both from Timor and Java, received from the Leyden Herbarium, I am inclined to think that the form and venation of the leaflets, which are, moreover, perfectly glabrous, are sufficient to keep it distinct.

45. A. FORBESII, *Benth.! in Hook. Lond. Journ.* iii. 92. Velutino-pubescens. Pinnæ 2–4-jugæ; foliola 10–15-juga, falcato-oblonga, obtusa, 2–4 lin. longa, coriacea, utrinque rufo-sericea v. supra glabrata, costa submarginali. Pedunculi axillares. Flores sessiles, rufo-sericei. Calyx 1–1$\frac{1}{2}$ lin., corolla 3–3$\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. Subtropical south-east Africa: Delagoa Bay, *Forbes*.

The small obtuse leaflets distingish this from all other species with the marginal midrib.

46. A. JULIBRISSIN, *Durazz. in Mag. Tosc.* iii. pars iv. (1772) 11, *ex F. Muell. in Trim. Journ. Bot.* 1872. Glabra v. molliter pubescens. Stipulæ lineares. Pinnæ 7–11-jugæ; foliola 20–40-juga, falcata, acuta, 4–6 lin. longa, costa margini contigua. Pedunculi fasciculati, axillares v. subracemosi. Flores sessiles, puberuli v. sericei. Calyx 1–1$\frac{1}{2}$ lin., corolla 3–4 lin. longa. Legumen 4–6-pollicare, $\frac{3}{4}$–1 poll. latum.—*Oliv. Fl. Trop. Afr.* ii. 356.

Mimosa Julibrissin, Scop. Del. Insubr. 18, t. 8.

Acacia Julibrissin, Willd. Spec. iv. 1065.

Mimosa arborea, Thunb. Fl. Jap. 229; Kæmpf. Ic. Sel. t. 19; Gmel. Reise, t. 40; Forsk. Fl. Æg. Arab. 177.

M. speciosa, Thunb. in Trans. Linn. Soc. ii. 336.

Acacia Nemu, Willd. Spec. iv. 1065.

Mimosa Nemu, Poir. Dict. Suppl. i. 69.

Var. MOLLIS, undique molliter pubescens.

Acacia mollis, Wall.! Pl. As. Rar. ii. 76, t. 177.

Albizzia mollis, Boiv. in Encyl. XIX Siècl. ii.

Acacia Isembergiana, Schimp.! Pl. Abyss. Exs.

Inga Isembergiana, A. Rich. Fl. Abyss. i. 236.

Albizzia Isembergiana, Fournier in Ann. Sc. Nat. ser. 4, xiv. 373.

Hab. Subtropical and temperate Asia, from Persia to China and Japan, also North-east tropical Africa: Abyssinia, but frequently planted; introduced also into the Mediterranean region and many parts of America.

47. A. STIPULATA, *Boiv. in Encycl. XIX Siècl.* ii. Pubescens. Stipulæ amplæ, mem-

branaceæ, caducissimæ. Pinnæ 7–10-jugæ; foliola 20–40-juga, lineari-falcata, acuta, 3–5 lin. longa, costa margini contigua. Pedunculi breves, axillares v. racemosi. Flores sesiles, sericeo-puberuli. Calyx 1–1¼ lin., corolla 2½–3 lin. longa. Legumen 3–6-pollicare, 9–10 lin. latum, inter semina sæpe transverse secedens.—*Benth. Fl. Hongk.* 102; *Bedd. Fl. Sylv.* t. 55.

Mimosa stipulata, Roxb.! Cat. Hort. Beng. 40 (*M. stipulacea*, Fl. Ind. ii. 549).
Acacia stipulata, DC. Prod. ii. 469.
Arthrosprion stipulatum, Hassk. Retzia, 212.
Mimosa marginata, Lam. Dict. i. 12.
Acacia marginata, Ham.! in Wall. Cat. Herb. Ind. n. 5243.
Acacia lomatocarpa, DC. Prod. ii. 467.
Inga umbraculiformis, Jungh. in Flora, 1847, 508.
Mimosa Smithiana, Roxb.! Fl. Ind. ii. 550.
Acacia Smithiana, Wall.! Cat. Herb. Ind. n. 5237.
Acacia arrophula, Wall. l. c. 5257, non Don.
Inga purpurascens, Hassk. in Flora, 1842, Beibl. ii. 103, Hort. Bogor. 291.
Albizzia purpurascens, Blume, ex Miq. Fl. Ind. Bat. i. pars i. 28.

Hab. Tropical and subtropical Asia: Ceylon and the Peninsula to Nepaul, Khasia, Burma, South China, and the Archipelago.

I had formerly, on the authority of Wight and Arnott, referred Lamarck's *A. marginata* to *A. odoratissima*; but it is evident from his description, taken from a Pondichéry specimen, and the figure he quotes (*Waga*, Rheede, Hort. Malab. vi. 9, t. 5), that his plant is identical with the *A. stipulata*. The character upon which Hasskarl founded his genus *Arthrosprion*, the breaking-up of the pod into monospermous articles, is so very vague a one, and showing so rarely on dried specimens of apparently ripe pods, that I formerly thought he must have alluded to the *Acacia concinna*, in which the separation of the pod into articles seems to occur at least as frequently; but on studying his description, it is evident he had the true *A. stipulata* in view.

Sectio 3. Zygia.

Flores in capitulis globosis sessiles v. brevissime pedicellati. Staminum tubus tenuis corolla pluries longior, in alabastro spiraliter tortus, filamentis apice breviter liberis.

48. A. Brownei, *Oliv.! Fl. Trop. Afr.* ii. 362. Glabra v. puberula. Pinnæ 2–3-rarius 4-jugæ; foliola 3–5-juga, oblique rhombea v. obovata, majora 1½–3-pollicaria. Pedunculi fasciculati, axillares v. ad apices ramorum breviter racemosi. Calyx 1–1½ lin., corolla 3–4 lin. longa. Legumen 4–6-pollicare, ad 1 poll. latum.

Inga zygia, DC.! Mém. Lég. 440, t. 65.
Zygia Brownei, Walp. Rep. i. 928.

Hab. West tropical Africa.

49. A. Welwitschii, *Oliv.! Fl. Trop. Afr.* ii. 362. Glabra v. cano-puberula. Pinnæ 3–4-rarius 5-jugæ; foliola 4–8-juga, oblique ovato- v. oblongo-rhombea, majora 1–2-pollicaria. Pedunculi axillares v. breviter racemosi. Calyx vix 1 lin., corolla fere 3 lin. longa. Legumen 4–5-pollicare, ¾–1 poll. latum.

Zygia Brownei, Schweinf. Rel. Kotsch. 10, t. 10.

Hab. East and west tropical Africa.

50. A. Petersiana, *Oliv.! Fl. Trop. Afr.* ii. 362. Glabra v. vix puberula. Pinnæ 2–4-jugæ. Foliola 3–6-juga, obovato-rhombea, obtusa, 4–6 lin. longa v. majora, rarius sub-

pollicaria. Pedunculi tenues, fasciculati. Flores distincte pedicellati. Calyx vix 1 lin., corolla ad 5 lin. longa. Legumen ignotum.

Zygia Petersiana, Bolle in Peters, Mossamb. Bot. i. t. 1.

Hab. South-east tropical Africa.

51. A. FASTIGIATA, *Oliv.! Fl. Trop. Afr.* ii. 361. Ferrugineo-puberula. Pinnæ 4–7-jugæ; foliola 8–15-juga, ovato- v. oblongo-rhombea, obtusa, 4–6 lin. longa. Pedunculi axillares v. ad nodos fasciculati. Calyx $1\frac{1}{2}$–2 lin. longus. Corolla 3–4 lin. longa. Legumen 4–6-pollicare, 1–$1\frac{1}{2}$ poll. latum.

Zygia fastigiata, E. Mey.! Comm. Pl. Afr. Austr. 165.

Inga fastigiata, Steud. Nom. Bot. ed. 2.

Mimosa adianthifolia, Schum. et Thonn.! Beskr. Pl. Guin. 322.

Inga Sassa, Willd. Spec. iv. 1027 (*Sassa,* Bruce, Trav. v. 27, ed. 2, vii. 141 cum ic.).

Mimosa Sassa, Poir. Dict. Suppl. i. 49.

Hab. Tropical and South-eastern subtropical Africa to the Natal district; and, apparently the same, Madagascar, *Commerson.*

52. A. BRACHYCALYX, *Oliv.! Fl. Trop. Afr.* ii. 361. Puberula. Pinnæ 4–7-jugæ. Foliola 8–15-juga, ovato- v. oblongo-rhombea, 3–5 lin. longa. Pedunculi tenues. Flores distincte pedicellati. Calyx $\frac{1}{2}$ lin., corolla 3–4 lin. longa. Legumen ignotum.—*Grant in Trans. Linn. Soc.* xxix. t. 37.

Hab. North-east tropical Africa: Lake Victoria Nyanza, *Speke and Grant.*

XXIV. PITHECOLOBIUM, Mart.

Benth. et Hook. Gen. Pl. i. 597.

The pod in this genus is almost as much diversified as in *Acacia,* often very different in species otherwise closely allied, and in many species as yet unknown. The following sections, therefore, already somewhat modified from those I had formerly proposed, may require some further alterations as the species become better known:—

Sect. 1. UNGUIS-CATI. Stipulæ plurimæ v. omnes spinescentes. Pinnæ 1-jugæ v. inæqualiter 2-jugæ. Foliola 1- paucijuga. Legumen valde curvatum v. circinatum, valvis post dehiscentiam contortis. Seminum funiculus in axillam carnosam expansus. Species 1–12, omnes Americanæ, una in orbe vetere inquilina.

Sect. 2. CLYPEARIA. Inermes. Pinnæ 1- paucijugæ. Foliola 1- paucijuga, ampla. Capitula parva, paniculata (exceptis *P. Junghuhniano* et *P. pruinoso*). Legumen valde curvatum v. circinatum (excepto *P. bubalino*), valvis post dehiscentiam flexuosis v. contortis. Seminum funiculus haud dilatatus.—Species 13–35, omnes Gerontogeæ.

Series 1. *Sessiliflorœ.* Species 13–29.

Series 2. *Pedicellatæ.* Species 30–35.

Sect. 3. ABAREMOTEMO. Inermes. Pinnæ 1- plurijugæ. Foliola pauci- v. multijuga rarius 1-juga. Pedunculi axillares v. breviter racemosi. Legumen valde curvatum v. circinatum, valvis post dehiscentiam contortis. Seminum funiculus haud dilatatus. Species 36–53, omnes Americanæ.

Sect. 4. SAMANEA. Inermes v. rarissime spinæ axillares. Pinnæ pluri- rarius 1-jugæ. Foliola uni-, pauci- v. multijuga. Pedunculi axillares v. paniculati. Legumen planum v. subteres, indehiscens v. tardius in valvas non tortas dehiscens, nunc articulatum. Series prima amphigæa, cæteræ omnes Americanæ. Species 54–81.

Series 1. *Subarticulatæ.* Legumen lineis transversis depressis inter semina notatum, sæpius in articulos monospermos divisum. Pedunculi axillares v. racemosi. Species 54–62.

Series 2. *Carnosæ*. Legumen crasso-carnosum, compressum v. teres, continuum v. moniliforme, nec articulatum. Pedunculi axillares v. breviter racemosi. Species 63–69.

Series 3. *Coriaceæ*. Legumen planum, coriaceum, continuum. Pedunculi axillares v. breviter racemosi. Species 70–76.

Series 4. *Parvifloræ*. Legumen planum, tenuiter coriaceum, continuum. Capitula parva, racemoso-paniculata. Species 77–81.

Sect. 5. ORTHOLOBIUM. Stipulæ spinescentes. Pinnæ 1- plurijugæ. Foliola 1- plurijuga. Legumen planum rectum in valvas tenues non tortas dehiscens. Species 82–86, omnes Americanæ.

Sect. 6. CAULANTHON. Inermes. Pinnæ 1- rarius plurijugæ. Foliola paucijuga, ampla, rarius plurijuga et minora. Legumen planum, rigide coriaceum, rectum v. arcuatum. Spicæ breves v. elongatæ, ad nodos ramorum defoliatorum aggregatæ. Species 87–102, omnes Americanæ.

Sect. 7. CHLOROLEUCON. Spinæ hinc inde axillares solitariæ v. geminæ. Pinnæ 2- plurijugæ. Foliola 5- multijuga, parvula. Spicæ ad axillas pedunculatæ. Flores tenues, glabri. Legumen planum, coriaceum v. subcarnosum, rectum v. curvum, vix dehiscens. Species 103–108, omnes Americanæ.

Sectio 1. UNGUIS-CATI.

Stipulæ spinescentes v. rarius 0. Pinnæ 1-jugæ v. inæqualiter 2-jugæ. Foliola uni- v. paucijuga, cujusve paris æqualia. Glandula inter pinnas. Pedunculi axillares v. superiores v. omnes racemosi v. paniculati. Flores glabri v. pubescentes. Legumen valde curvatum v. circinatum, interdum 2–3-gyrosum, valvis planis v. convexis, post dehiscentiam valde contortis, intus rubentibus (et pulposis ?). Seminum funiculus apice in arillum carnosum coloratum dilatatus (excepto *P. paraguensi*).

* *Spicæ ovoideæ oblongæ v. elongatæ.*

1. P. MACROSTACHYUM, *Benth.! in Hook. Lond. Journ.* v. 105, *non ejusd. l. c.* iii. 198. Pinnæ 1-jugæ; foliola 1-juga, oblongo-lanceolata, falcata, sub-3-pollicaria. Spicæ pedunculique pluripollicares. Calyx $1\frac{1}{2}$–2 lin., corolla 4–5 lin. longa. Staminum tubus longissime exsertus. Legumen ignotum.

Mimosa macrostachya, Vahl! Ecl. iii. 34, t. 26, nec *M. brachystachya*, uti a DC., lapsu calami, citatur.

Inga macrostachya, Steud.; DC. Prod. ii. 437.

Hab. Tropical America: Cayenne, *v. Rohr.*

2. P. LIGUSTRINUM, *Klotzsch! in Herb. Berol.* Pinnæ 1-jugæ; foliola 1-juga, oblique ovato-oblonga, obtusa v. obtuse acuminata, 1–3-pollicaria, glabra, viridia v. albicantia. Spicæ tenues, 1–3-pollicares. Flores puberuli. Calyx vix $\frac{1}{2}$ lin., corolla 2–3 lin. longa. Staminum tubus exsertus v. subinclusus. Leguminis valvæ convexæ coriaceæ.

Mimosa ligustrina, Jacq. Fragm. 29, t. 32. f. 6, non Vahl.

Inga ligustrina, Willd. Spec. iv. 1007.

Pithecolobium macrostachyum, Benth.! in Hook. Lond. Journ. iii. 198, excl. syn. Vahl.

Inga lanceolata, Humb. et Bonpl. in Willd. Spec. iv. 1005, Kunth! Mim. 49, t. 15.

Mimosa lanceolata, Poir. Dict. Suppl. i. 37.

Pithecolobium lanceolatum, Benth.! in Hook. Lond. Journ. v. 105.

Hab. Tropical America: Cayenne, Venezuela, New Granada, and Central America, to Vera Cruz.

3. P. HYMENEÆFOLIUM, *Benth.! in Hook. Lond. Journ.* iii. 198. Pinnæ 1-jugæ; foliola 1-juga, oblique oblonga, obtusa v. obtuse acuminata, 2–4- rarius 5-pollicaria, glabra. Spicæ densissimæ, oblongæ v. cylindraceæ, 1–3-pollicares. Flores appresse pubescentes. Calyx vix 1 lin., corolla fere 6 lin. longa. Staminum tubus longe exsertus.

Inga hymeneæfolia, Humb. et Bonpl.! in Willd. Spec. iv. 1008.
Mimosa hymeneæfolia, Poir. Dict. Suppl. i. 38.
Pithecolobium panamense, Walp.! in Linnæa, xxiii. 746.

Hab. Tropical America: Venezuela, New Granada, Panama.

4. P. OBLONGUM, *Benth.! in Hook. Lond. Journ.* iii. 198. Pinnæ 1-jugæ; foliola 1-juga, oblique ovali-oblonga, 1–2-pollicaria, glabra. Pedunculi tenues. Spicæ novellæ fere globosæ, demum tenues, $\frac{1}{2}$–$\frac{3}{4}$ poll. longa. Calyx $\frac{1}{2}$ lin., corolla fere 2 lin. longa. Staminum tubus subinclusus. Leguminis valvæ ante dehiscentiam planæ, ad 4 lin. latæ, demum valde contortæ.

Hab. Tropical America: Panama, *Cuming*, n. 1155, *Seemann*, *Duchassaing*; Gulf of Fonseca, *Sinclair*; Nicaragua, *Œrsted*; and appparently the same, Trinidad, *Crueger*.

** *Capitula globosa.*

5. P. DULCE, *Benth. in Hook. Lond. Journ.* iii. 199. Inflorescentia cano-pubescente excepta, glabrum. Pinnæ 1-jugæ; foliola 1-juga, obovata v. oblonga, obtusa, valde obliqua, subpollicaria. Capitula breviter pedunculata, superiora paniculato-racemosa. Flores cano-pubescentes. Calyx 1 lin., corolla $1\frac{1}{2}$ lin. longa "alba." Legumen torulosum, valvis 4–6 lin. latis demum valde contortis.—*Bedd. Fl. Sylv.* t. 188.

Mimosa dulcis, Roxb.! Corom. Pl. i. 67, t. 99.
Inga dulcis, Willd. Spec. iv. 1005; Wight, Ic. t. 198.
Inga pungens, Humb. et Bonpl.! in Willd. Spec. iv. 1004.
Mimosa pungens, Poir. Dict. Suppl. i. 36.
Mimosa unguis-cati, Blanco, Fl. Filip. 731, in ed. 2. omissa, non Linn.
Inga leucantha, Presl! Bot. Bem. 65.
Inga Javana, DC. Prod. ii. 436, ex char. et fragm. in herb. DC.!
Acacia obliquifolia, Mart. et Gal.! in Bull. Acad. Brux. x. ii. 317.

Hab. Tropical America: Central America from New Granada to South Mexico, introduced into the Philippine Islands, and thence into East India, where it is now common, occurring also in the Archipelago, the Mauritius and other tropical countries.

6. P. PUBESCENS, *Benth.! in Hook. Journ. Bot.* ii. 141; *Lond. Journ.* iii. 199. Pubescens. Pinnæ 1-jugæ; foliola 1-juga, ovali-elliptica v. oblonga, obtusa, valde obliqua, 1–2-pollicaria, utrinque pubescentia. Capitula breviter pedunculata, superiora paniculata. Flores tomentelli. Calyx $\frac{3}{4}$ lin., corolla ad 3 lin. longa "rosea." Legumen non vidi.

Inga pubescens, Bert.! in DC. Prod. ii. 437.
Inga paniculata, Spreng.! in DC. Prod. ii. 437.

Hab. Tropical America: British Guiana and Santa Marta.

7. P. UNGUIS-CATI, *Benth.! in Hook. Lond. Journ.* iii. 200. Glabra. Pinnæ 1-jugæ; foliola 1-juga, obovata orbiculata v. late oblonga, valde obliqua, obtusa, $\frac{1}{2}$–2-pollicaria.

Capitula longiuscule et tenuiter pedunculata, superiora paniculata. Flores glabri v. vix puberuli. Calyx $\frac{3}{4}$–1 lin., corolla ad 3 lin. longa. Legumen subtorulosum, glabrum, valvis 3–6 lin. latis, demum valde tortis.

Mimosa unguis-cati, Linn. Spec. 1499, ad ic. Plum. t. 4; Jacq. Hort. Schœnbr. iii. t. 392.
Inga unguis-cati, Willd. Spec. iv. 1006.
Mimosa rosea, Vahl, Ecl. iii. 33, t. 25.
Inga rosea, Steud.; DC. Prod. ii. 437.
Inga forfex, Kunth! Mim. 52, t. 16, foliolis sæpius late oblongis.
Pithecolobium forfex, Benth.! in Hook. Lond. Journ. iii. 199.
Inga guadalupensis, Desv.! Journ. Bot. 1814, i. 70.
Mimosa guadalupensis, Pers. Syn. ii. 262..
Inga microphylla, Humb. et Bonpl.! in Willd. Spec. iv. 1004, foliolis parvis.
Mimosa microphylla, Poir. Dict. Suppl. i. 36.
Pithecolobium microphyllum, Benth. in Hook. Lond. Journ. iii. 200.

Hab. Tropical America: West Indies, Venezuela, and New Granada.

The three forms, the typical *unguis-cati* with large mostly broad leaflets, *microphylla* with small broad leaflets, and *forfex* with narrower large leaflets, which I had maintained as distinct, prove to be connected by so many intermediates, that I have felt obliged to revert to the Linnean species, which included all three.

8. P. HYSTRIX, *Benth.! in Hook. Ic. Pl.* t. 1168. Glabra. Folia minima; pinnæ 1-jugæ; foliola 1-juga, obovata, coriacea, 1–2 lin. longa. Pedunculi axillares. Flores glabri. Calyx vix 1 lin., corolla 3–3½ lin. longa. Legumen annulare, valvis demum tortis tenuiter coriaceis 4 lin. latis.

Inga hystrix, A. Rich! Fl. Cub. i. 471.
Calliandra hystrix, Griseb. Cat. Pl. Cub. 83.
Pithecolobium calliandrifolium, Griseb.! *l. c.*

Hab. Tropical America: Cuba.

9. P. CIRCINALE, *Benth.! in Hook. Lond. Journ.* iii. 201. Glabrum v. puberulum. Pinnæ 1- rarius 2-jugæ; foliola pinnarum terminalium 2-3-juga, late ovata v. obovata, obtusa, sæpius longiuscule mucronata, $\frac{3}{4}$–1-pollicaria. Capitula longe pedunculata. Flores minute tomentelli. Calyx $\frac{3}{4}$ lin., corolla fere 3 lin. longa. Legumen subannulare, valvis demum tortis 4–5 lin. latis.

Mimosa circinalis, Linn. Spec. 1499, ad ic. Plum. t. 5; Catesb. Carol. ii. t. 97.
Inga circinalis, Willd. Spec. iv. 1023.
Inga spinifolia, Desv.! in Journ. Bot. 1814, i. 72, et in Ann. Sc. Nat. ser. 1, ix. 426.
Pithecolobium spinifolium, Benth. in Hook. Lond. Journ iii. 200.

Hab. Tropical America: West-Indian Islands, Cuba, *Wright*, n. 3546; St. Domingo. *Bertero, Ehrenberg, Ritter*; Bahamas (*Catesby*).

10. P. EXCELSUM, *Mart.! Herb. Fl. Bras.* 115. Glabra v. tenuiter canescens. Pinnæ 1- rarius 2-jugæ; foliola pinnarum terminalium 2-juga, oblique obovata v. elliptica, obtusa, vix mucronulata, $\frac{1}{2}$–1 poll. longa. Capitula pedunculata, paniculata. Flores vix puberuli. Calyx $\frac{1}{2}$–$\frac{3}{4}$ lin., corolla 3–4 lin. longa. Legumen valde arcuatum v. annulare. puberulum v. glabrum, valvis 5–6 lin. latis, demum valde tortis.

Inga excelsa, Kunth! Mim. 57, t. 18.

Inga candida, H. B. et K.! Nov. Gen. et Sp. vi. 299.
Pithecolobium candidum, Benth. in Hook. Lond. Journ. iii. 201.

Hab. Tropical America: Guayaquil, and on the river Magdalena.

11. P. DIVERSIFOLIUM, *Benth. in Hook. Lond. Journ.* iii. 201. Pubescens. Pinnæ 1–2-jugæ; foliola pinnarum terminalium 2–3-juga, obovata v. oblonga, ½–1-pollicaria v. foliorum ramealium minima, obtusissima, valde obliqua. Pedunculi axillares v. ad apices ramorum conferti. Flores cano-pubescentes. Calyx fere 1 lin., corolla 3½–4 lin. longa. Leguminis valvæ ad 4 lin. latæ, minute tomentellæ, demum valde contortæ.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Piauhy, Bahia, and Minas Geraes.

*** *Species anomala, inermis. Leguminis valvæ haud contortæ. Seminum funiculus haud dilatatus.*

12. P. PARAGUENSE, *Benth.*, sp. n. Glabra. Pinnæ 1-jugæ; foliola 1-juga, obovato-oblonga, ½–1-pollicaria. Flores ignoti. Spicæ fructiferæ rhachis ½–1-pollicaris. Legumen 1½-pollicare v. abortu brevius, 4–5 lin. latum, valvis coriaceis convexis.

Hab. Subtropical South America: Paraguay, Monte Claro, *Gibert.*

Rami teretes, rigidi, cortice albido, in speciminibus nostris omnino inermes. Foliorum petiolus communis ¼–½-pollicaris. Glandula inter pinnas parva. Foliola rigidula, obtusiuscula, basi valde obliqua, pallide virentia, pennivenia, venis venulisque utrinque conspicuis. Spicarum rhaches seu pedunculi ad nodos annotinos rigidi. Leguminis valvæ extus fuscæ, intus rubentes pulposæ. Semina alba, crassa, subquadrata, funiculo filiformi flexuoso.

Sectio 2. CLYPEARIA.

Inermes. Stipulæ inconspicuæ. Pinnæ uni- v. paucijugæ foliolis uni- v. paucijugis amplis, v. plurijugæ foliolis plurijugis minoribus. Capitula parva, sæpius paniculata, ramis paniculæ pedunculisque sæpius superposite fasciculatis. Legumen valde curvatum v. circinatum, interdum 2–3-gyrosum, valvis coriaceis post dehiscentiam varie tortis. Seminum funiculus apice haud dilatatus. Species omnes Asiaticæ v. Australasicæ.

In *P. bubalino* legumen crassum, parum curvatum.

Series 1. Sessilifloræ. *Flores in capitulo sessiles, pauci v. rarius numerosi. Pinnæ* (*excepto* P. subcoriaceo) 1–2- *rarius* 3-*jugæ; foliolis amplis paucijugis, vix obliquis.*

Several of the following species are scarcely to be distinguished from each other, or even from *Albizzia lucida*, by the foliage or flowers, and without the fruits have often been mistaken the one for the other by myself as well as by other botanists. The pods, however, are very different, and appear to be constant in each species. Some assistance may also be afforded by geographical station, and possibly, when studied on the living trees, constant characters in the proportions of the flowers, the glands, &c. may be discovered which have hitherto escaped us.

13. P. FOURNIERI, *Vieill.!* (*sub Albizzia*), sp. n. Glabra. Pinnæ 1-jugæ; foliola 2–3-juga, oblongo-elliptica v. obovato-oblonga, obtusa, majora 2–3-pollicaria, basi contracta, breviter petiolulata. Paniculæ laxæ. Flores in capitulo 10–15, glabri. Calyx 1 lin., corolla 4 lin. longa. Legumen valde curvum v. cochleatum, valvis subplanis coriaceis demum tortis.

Hab. New Caledonia, *Vieillard*, n. 409, 427.

P. bigemino valde affinis. Differt foliolis non vel vix acuminatis, floribus majoribus glaberrimis.

14. P. BIGEMINUM, *Mart.! Herb. Fl. Bras.* 115. Minute tomentellum v. glabrescens. Pinnæ 1- rarius 2-jugæ; foliola 2–4-juga, ovata v. oblonga, acuminata, 2–3- rarius 4-pollicaria. Paniculæ laxæ. Flores in capitulo pauci, appresse puberuli. Calyx $\frac{3}{4}$–1 lin., corolla 2–$2\frac{1}{2}$ lin. longa. Legumen sæpe bigyrosum, margine exteriore integro v. rarius leviter sinuato, valvis subplanis coriaceis aveniis demum tortis. Semina compressa.

Mimosa bigemina, Linn. Spec. 1499; Vahl! Symb. ii. 103.

Inga bigemina, Willd. Spec. ii. 1007.

Inga Wightiana, Grah.! in Wall. Cat. Herb. Ind. n. 5281.

Inga annularis, Grah.! *l. c.* n. 5269.

Hab. Tropical and subtropical Asia: Ceylon, the Peninsula, Nepal, and Sikkim.

Although the leaves are rarely, if ever, truly bigeminous, this appears to be the plant Linnæus had in view, and is certainly that of Vahl and others. The Ceylon specimens are more glabrous, with shorter calyxes; the northern ones, on the contrary, more tomentose (though very minutely so), with the calyx longer in proportion to the corolla. The Archipelago specimens referred here by myself and others belong probably to *P. lobatum*.

15. P. LOBATUM, *Benth.! in Hook. Lond. Journ.* iii. 208. Glabrum. Pinnæ 1–2-jugæ; foliola 2–3-juga, ovata v. oblonga, acuminata, 3–6-pollicaria. Paniculæ pleræque in ramis annotinis laterales, laxæ. Flores in capitulo pauci (sæpius 2–3), glabri v. puberuli. Calyx $\frac{1}{2}$–1 lin., corolla ad 2 lin. longa. Legumen bigyrosum v. elongatum irregulariterque tortum, margine exteriore inter semina ad medium v. altius diviso, lobis orbiculatis crassis 1–2 poll. diametro. Semina magna, compressa, orbiculata.

Inga lobata, Wall.! Cat. Herb. Ind. n. 5280.

Mimosa Kœringa, Roxb. Hort. Beng. 40; Fl. Ind. ii. 543.

Mimosa Jiringa, Jack, in Mal. Misc. i. i. 14.

Inga Jiringa, Jack, *l. c.* ii. vii. 78.

Mimosa scutifera, Blanco, Fl. Filip. 735, ed. 2. 507, ex char.

Pithecolobium scutiferum, Benth.! in Hook. Lond. Journ. iii. 211.

P. pauciflorum, Benth.! *l. c.* 212.

Hab. Tropical Asia, Java, Borneo, *Beccari*, n. 3060; Burmah, *Wallich*; Philippines, *Cuming*, n. 475, 1603, 1854.

The specimens which in 'Plantæ Junghuhnianæ' I referred to *Albizzia lucida*, probably belong to this species, as well as several other Javan ones referred in various herbaria to *P. bigeminum*, from neither of which can this species be readily distinguished without the pod. This is usually a little more than an inch broad at the seeds and indented to about half between them; but sometimes the seeds themselves are said to be as large as those of *Entada scandens*, and the pod is often so deeply indented as to leave between the seeds only a narrow rhachis. The pod is also sometimes lengthened out without being folded into a regular coil. Blanco describes the pod of his *M. scutifera* as I have myself seen it in his Philippine-Island specimen in the Paris Herbarium, as nearly a foot long, with the lobes almost regularly turned alternately to the right and to the left; but as I have seen no two specimens in which the pods are similarly twisted, I am induced to believe that all belong to one species. *P. lateriflorum*, Bl., referred by Miq. (Fl. Ind. Bat. i. i. 34) to *P. angulatum*, has, according to the specimens received from Leyden, the flowers sessile, and does not appear to me to be distinct from *P. lobatum*.

16. P. MOTTLEYANUM, *Benth.*, sp. n. Glabrum. Pinnæ 1-jugæ; foliola 1–2-juga,

ovali-elliptica, acuminata, subcoriacea, nitidula, 1½–2-pollicaria. Panicula ampla, laxiflora. Flores in capitulo 1–3, appresse puberuli. Calyx ¾ lin., corolla 3 lin. longa. Legumen cochleato-contortum, margine exteriore leviter sinuato, valvis extus fuscis ad 6 lin. latis.

Hab. Tropical Asia: Borneo, *Mottley*.

Pluribus notis *P. laxifloro* accedit. Folia in specimine nostro ad ramulum lateralem pertinere videntur et forte in ramulis majoribus majora. Petiolus communis subpollicaris, pinnarum rhaches pleræque longiores, omnes seta crassiuscula persistente terminatæ, quod in speciebus finitimis non observavi. Glandula petiolaris oblonga. Paniculæ rami tenues. Pedunculi ultimi filiformes, 2–3 lin. longi, apice bibracteolati, floribus 1–2 rarius 3 intra bracteas sessilibus. Flores iis *P. laxiflori* forma et proportione similes sed pubescentes nec glabri.

17. P. LAXIFLORUM, *Benth. in Hook. Lond. Journ.* iii. 212. Glabrum. Pinnæ unijugæ; foliola 2–3-juga, ovali-oblonga, obtuse acuminata, ad 3 poll. longa, petiolo rhachibusque tenuibus. Paniculæ laxæ. Flores in capitulo 2–5, glabri. Calyx vix 1 lin., corolla ad 2 lin. longa. Legumen (an ejusdem speciei?) subcontortum, 6 lin. latum, margine exteriore leviter sinuato, valvis in sicco rufescentibus.

Acacia laxiflora, DC.! Prod. ii. 455; Dcne. Herb. Tim. Descr. 132.

Hab. Tropical Asia: Timor and perhaps Amboina.

The Timor specimens described by De Candolle and Decaisne are in flower only; and in that state it is impossible to determine how far they are distinct from *C. lobatum*, from which they differ in the neat slender petioles and slightly in general aspect. A specimen from Amboina, in Herb. Mus. Par., gathered by Labillardière, appeared to me to be the same species; and if so, the pod is much nearer that of *P. bigeminum*; but probably this specimen may be referrible to *P. Mottleyanum*.

18. P. BUBALINUM, *Benth.* Inflorescentia rufo-tomentella. Folia glabrata. Pinnæ 1-jugæ; foliola 1–2-juga, ovata v. ovali-oblonga, acuminata, 3- rarius 4-pollicaria, nitidula. Paniculæ axillares v. terminales, folio sæpius breviores, floribundæ. Flores tomentelli, in capitulis numerosis breviter pedunculatis pauci. Calyx ad ¾ lin., corolla 2½ lin. longa. Legumen sessile, curvum, tomentellum, 2–3-pollicare, 1–1½ poll. latum, valvis crassocoriaceis valde convexis vix tortis. Semina crassissima, conferta, mutua compressione truncata, ½–¾ poll. diametro.

Inga bubalina, Jack, in Mal. Misc. ii. vii. 77.

Hab. Tropical Asia: Malacca, *Griffith*, *Maingay*; Penang, *Wallich*.

Notwithstanding the very anomalous pod, this species is evidently closely allied to the following, and scarcely to be distinguished from it when in flower only.

19. P. MICROCARPUM, *Benth.*, sp. n. Inflorescentia rufo-tomentella. Folia glabrata. Pinnæ 1-jugæ; foliola 2–4- juga, ovata v. ovali-oblonga, acuminata, 3–4-pollicaria, nitidula. Paniculæ axillares, laxiusculæ, floribundæ, foliis sæpius breviores. Flores tomentelli, in capitulis pauci. Calyx ad ½ lin., corolla 2 lin. longa. Legumen glabrum, siccitate nigrum, flexuoso-contortissimum, valvis convexis, 3–4 lin. latis. Semina distantia, subglobosa, 3–4 lin. diametro.

Hab. Tropical Asia: Malacca, *Griffith*, *Maingay*.

As to foliage very difficult to distinguish from *P. bubalinum*, the pod very different, smaller than in any other species of the section.

20. P. LUCIDUM, *Benth.! in Hook. Lond. Journ.* iii. 207. Ferrugineo-tomentellum, foliis demum glabratis. Pinnæ 1–2-jugæ; foliola 2–4- rarius 5-juga, ovata v. late oblonga, acuminata, subcoriacea, nitida, 1½–3-pollicaria, inferiora sæpius alterna. Paniculæ axillares, foliis breviores. Flores pubescentes, in capitulo 15–20. Calyx ¾–1 lin., corolla fere 3 lin. longa. Legumen circinatum v. laxe contortum, margine exteriore leviter sinuatum, valvis ¾ poll. latis aveniis demum contortis. Semina crassa, ovoidea, semi-pollicaria.—*Fl. Hongk.* 102.

Inga bigemina, Hook. et Arn.! Bot. Beech. 182, non Willd.

Albizzia Championi, Benth.! in Hook. Kew Journ. iv. 79.

Hab. Tropical Asia: South China, Hongkong, and Macao.

Distinguished from all the allied species by the lower leaflets of each pinna very rarely opposite.

21. P. FASCICULATUM, *Benth.! in Hook. Lond. Journ.* iii. 208. Glabrum v. inflorescentia puberula. Pinnæ unijugæ. Foliola 2–3-juga, ovali-oblonga, 6–10-pollicaria. Panicula terminalis, floribunda, ramulis pedunculisque secus ramos insigniter fasciculato-supra-positis. Flores adpresse pubescentes, in capitulo 3–5. Calyx 1 lin., corolla 2–3 lin. longa. Legumen breviter stipitatum, circinatum, valvis planis coriaceis aveniis 1¼–1½ poll. latis. Semina ovata, crassa, nigra, ¾-pollicaria.

Inga Jiringa, Wall.! Cat. Herb. Ind. n. 5268, non Jack.

Hab. Tropical Asia: Malacca, *Griffith*; Singapore, *Wallich, Maingay*; Java, *Junghuhn, Teijsmann*; Borneo, *Beccari*, n. 1134.

22. P. CONFERTUM, *Benth.*, sp. n. Glabrum v. inflorescentia vix rufo-tomentella. Pinnæ 1-jugæ; foliola 1–3-juga, ovata v. ovali-oblonga, breviter acuminata, coriacea, nitida, 3–4-pollicaria. Paniculæ axillares, breves, floribundæ. Pedunculi conferti, ½–1-pollicares. Flores glabri. Calyx ¾ lin., corolla 3–3½ lin. longa, tubo tenui. Legumen ignotum.

Hab. Tropical Asia: Malacca, *Griffith.*

Foliorum petiolus communis brevis, pinnarum rhaches 3–4-pollicares. Glandula ad basin pinnarum sæpius magna. Species inflorescentia brevi conferta et corollis tenuibus inter affines facile distinguenda.

23. P. ROSTRATUM, *Miq.! Fl. Ind. Bat. Suppl.* 282. Ferrugineo-tomentella. Pinnæ 2–3-jugæ; foliola 3–6-juga, petiolulata, obovali-oblonga, abrupte acuminata, membranacea, nitidula, 1–4-pollicaria. Panicula terminalis. Flores ferrugineo-sericei. Calyx 2 lin., corolla fere 5 lin. longa. Legumen "circulariter cochleato-coriaceum, ½ poll. latum, extrorsum subsinuatum, extus nigrescens. Semina ovoidea, nigrescentia."

Albizzia rostrata, Bl. in Miq. Fl. Ind. Bat. i. i. 24.

Hab. Tropical Asia: Java.

Our specimen is not good, and without fruit; but the species is evidently distinct from the others of this section; the flowers are larger than in the several preceding species, smaller than in the following one.

24. P. AFFINE, *Baker! in Hook. Fl. Ind. ined.* Tomentellum, foliis glabrescentibus. Pinnæ 1–2-jugæ; foliola 2–4-juga v. pinnarum inferiorum 1-juga, elliptico- v. ovali-oblonga, acuminata, 3–6-pollicaria. Panicula longa. Flores sessiles, angusti, appresse pubescentes. Calyx fere 3 lin., corolla 8–9 lin. longa. Legumen sessile, circinatum, valvis coriaceis venosis 1¼–1½ poll. latis tomentellis.

Hab. Tropical Asia: Malacca, *Maingay*, and (apparently the same without fruit) Borneo, *Lobb.*

This is a large-leaved species, distinguished from all the preceding as well by its much larger flowers as by the pod forming a complete circle, and at least as broad as in *P. fasciculatum*, but with a few prominent transverse branching veins, which in all the allied species are either very obscure or quite obsolete.

25. P. GRANDIFLORUM, *Benth. ! Fl. Austral.* ii. 424. Subglabrum. Pinnæ 1–2-jugæ; foliola 2–6-juga, ovata, acuminata, $1\frac{1}{2}$–2-pollicaria. Panicula terminalis. Flores sericeo-pubescentes. Calyx fere 3 lin., corolla 9 lin. longa, infundibularis. Legumen non vidi.

Mimosa grandiflora, Soland.! in Herb. Banks.

Pithecolobium Tozeri, F. Muell.! Fragm. v. 10.

Albizzia Tozeri, F. Muell. in Trim. Journ. Bot. 1872, 10.

Hab. Tropical and subtropical East Australia.

F. Mueller blames me for not having adopted his specific name of *Tozeri*, which he had sent me attached to his specimens, and which he now proposes to restore. I have always felt it my duty to adopt his manuscript names to the new Australian species where there were no predominant reasons against it; but in this instance I had already described the plant from Banks and Solander's specimens under Solander's name when I received F. Mueller's. Moreover, having two manuscript names before me, I could not adopt both; and if any right of priority can be admitted in unpublished names, it was certainly by far in favour of Solander's. The further ground urged by F. Mueller, the accident met with by Mr. Tozer in gathering the specimens, is one for sympathy on the part of botanists, not for changing the name of a species; the tree is said to be a very handsome one, with flowers still larger than in *P. affine*.

26. P. HENDERSONII, *F. Muell. Fragm.* v. 191. Glabrum. Pinnæ 1-jugæ; foliola 2–3-juga, sessilia, inæquilatero-ovata v. lanceolata, basi valde obliqua. Flores glabri, brevissime pedicellati. Corolla elongata, tubo calycem duplo superante.

Albizzia Hendersonii, F. Muell. in Trim. Journ. Bot. 1872, 10.

Hab. Extratropical East Australia, near Ballina, Richmond river, *Henderson.*

I have not seen this species, which F. Mueller says resembles *P. grandiflorum*, but has no glands between the leaflets, which are more sessile, and the flowers slender and glabrous.

27. P. CONTORTUM, *Mart.! Herb. Fl. Bras.* 115. Fusco-tomentellum. Pinnæ 4–5-jugæ; foliola pinnarum superiorum 12–20-juga, oblique ovato-oblonga, obtusa, 6–9 lin. longa, subtus tomentella. Panicula terminalis. Flores tomentelli, in capitula 3–4, sæpius secus rhachin dissiti. Calyx vix $\frac{3}{4}$ lin., corolla fere 2 lin. longa. Legumen cochleatum, 2–3-gyrosum v. demum elongato-contortum, margine exteriore sinuato, valvis fere 9 lin. latis demum contortis.

Inga contorta, Grah.! in Wall. Cat. Herb. Ind. n. 5283.

Inga Finlaysoniana, Grah.! in Wall. l. c. n. 5284.

Hab. Tropical Asia: Penang and Singapore.

28. P. SUBACUTUM, *Benth. ! in Hook. Lond. Journ.* iii. 210. Rufo-puberulum, glabrescens. Ramuli subangulati. Pinnæ 5–7-jugæ; foliola pinnarum superiorum 15–20-juga, oblique ovata, incurvo-acuta v. acuminata, subsemipollicaria, subtus puberula. Panicula terminalis, brevis. Flores in capitulo 5–6, brevissime pedicellati v. subsessiles, tomentoso-pubescentes. Calyx 1–$1\frac{1}{2}$ lin., corolla ad 3 lin. longa. Legumen cochleato-contortum, margine exteriore sinuato-lobato, ad 6 lin. latum.

Hab. Tropical Asia: Philippine Islands, *Blanco*, *Cuming*, n. 502.

The branches appear to be sometimes slightly angular, but much less so than in *P. clypearia* and its allies. The flowers are not so closely sessile as in *P. contortum*, but yet not borne on slender pedicels as in the truly pedicellate species.

29. P. SUBCORIACEUM, *Thw.! Enum. Pl. Zeyl.* 100. Ferrugineo-puberulum. Ramuli subangulati. Pinnæ 3–12-jugæ: foliola 10–25-juga, oblique oblonga, obtusa v. acutiuscula, 3–4 lin. longa, coriacea, supra glabra, nitidula, subtus pallida v. villosula. Pedunculi in summis axillis v. ad apices ramorum conferti. Flores pubescentes, in capitulo plurimi, sessiles. Calyx $1\frac{1}{4}$, corolla fere 3 lin. longa. Legumen "cochleatum, puberulum."

P. anamallayanum, Bedd.! Fl. Sylv. t. 189.

Hab. Tropical Asia: Ceylon, *Thwaites*; Peninsula near Courtallam, *Wight*; Anamallay hills, *Beddome*.

Major Beddome, suspecting that his was the same as the Ceylon plant, forwarded specimens to Dr. Thwaites, who thought it very distinct. Upon carefully comparing them, however, I can discover no more decided differences in the specimens themselves than in the descriptions given of the two. Thwaites characterizes the pinnæ as 3-jugæ, Beddome as 4–12-jugæ. Our specimens from Thwaites have sometimes 4 pair of pinnæ; and in those we have from Beddome they vary from 3 to 7 pair.

Series 2. Pedicellatæ. *Flores in capitulo plurimi, singuli pedicello distincto sæpius 1–2-lineari fulti. Pinnæ valde irregulares, addita interdum tertia ad jugum terminali.*

† *Ramuli teretes. Foliola majuscula, paucijuga.*

30. P. BORNEENSE, *Benth.*, sp. n. Minute puberula, glaucescens. Pinnæ 1–2-jugæ; foliola 2–3-juga, valde obliqua, ovata, acuminata, $2\frac{1}{2}$–4-pollicaria, coriacea, nitida. Paniculа terminalis, parum ramosa. Flores in rhache breviter lineari plures, pedicellati, pubescentes. Calyx vix 1 lin., corolla ad 3 lin. longa. Legumen ignotum.

Hab. Tropical Asia: Borneo, *Beccari*, n. 1715, 3491.

Ramuli teretes, demum glabrati, glaucescentes. Foliorum petiolus communis 1–3-pollicaris, glandula nunc majuscula oblonga, nunc minima. Pinnarum rhaches 2–4-pollicares, in eodem pari sæpe valde inæquales. Foliola petiolulata, interdum subfalcata pennivenia, juniora utrinque minute puberula, demum supra glabrata nitida et siccitate nigricantia, subtus ferrugineo-glaucescentia. Paniculæ rami in specimine perpauci. Pedunculi more affinium lateraliter superposite fasciculati, tenues, 3–6 lin. longæ, in parte superiore pedicellos 4–6 ferunt subdissitos, lineam longos.

31. P. JUNGHUHNIANUM, *Benth.! in Pl. Jungh.* i. 269. Ferrugineo-villosum. Pinnæ sub-2-jugæ; foliola pinnarum superiorum 3–5-juga oblique ovali-oblonga, obtusa, subacuminata, majora 3-pollicaria, inferiora minora, utrinque pubescentia. Pedunculi axillares, 3-pollicares. Flores in capitulo globoso numerosi, pubescentes, pedicellis 1–$1\frac{1}{2}$ lin. longis. Calyx $\frac{1}{3}$ lin., corolla $2\frac{1}{2}$ lin. longa. Legumen cochleatum v. elongato-contortum, margine exteriore sinuato, valvis 8–9 lin. latis.

Albizzia tengerensis, Miq. Fl. Ind. Bat. i. i. 25.

Inga tengerensis, Zoll. Nat. en Geneesk. Arch. iv. 13, ex Miq. *l. c.*

Albizzia Junghuhniana, F. Muell. in Trim. Journ. Bot. 1872, 9.

Hab. Tropical Asia: Java, *Junghuhn*, *Zollinger*, n. 2521, *Lobb*.

32. P. PRUINOSUM, *Benth. ! in Hook. Lond. Journ.* iii. 211. Tenuissime rufo-puberulum v. glabrum. Pinnæ 1–2-jugæ; foliola pinnarum superiorum 3–4-juga, late ovata v. subrhombea, acuminata, majora 2–3-pollicaria, subglabra. Pedunculi in summis axillis v. in panicula brevi corymbosa terminali. Flores glabriusculi, in capitulo globoso numerosi, pedicellis fere 2 lin. longis. Calyx $\frac{1}{2}$ lin., corolla 2 lin. longa. Legumen cochleatum v. longiuscule contortum, glabrum, valvis 7–8 lin. latis.—*Fl. Austral.* ii. 423.

Albizzia pruinosa, F. Muell. in Trim. Journ. Bot. 1872, 9.

Hab. Subtropical and extratropical East Australia.

Very near *P. Junghuhniana,* chiefly distinguished by being nearly glabrous, with smaller flowers.

†† *Ramuli angulati. Foliola pluri- v. multijuga.*

33. P. ANGULATUM, *Benth. ! in Hook. Lond. Journ.* iii. 208. Fusco-puberulum, glabrescens. Pinnæ 2–4-jugæ; foliola pinnarum superiorum 4–8-juga, oblique ovali-oblonga, acuminata, 3–5-pollicaria, inferiora multo minora, ovato-rhombea. Panicula terminalis. Flores in capitulo haud numerosi, pedicellati, tomentelli. Calyx linea brevior, corolla fere 3 lin. longa. Legumen circinatum v. elongato-tortum, 6–8 lin. latum, margine exteriore ad medium v. altius lobato.

Mimosa heterophylla, Roxb. Fl. Ind. ii. 545.

Inga acutangula, Grah. ! in Wall. Cat. Herb. Ind. n. 5271.

Acacia acutangula, Hamilt. ! Herb.

Hab. Tropical Asia : eastern provinces of India and the archipelago; Assam, Silhet, Burmah, Malacca, Penang, Borneo, &c.

P. acutangulum, Miq. Fl. Ind. Bat. Suppl. 282, from Sumatra, must, from the description given, be the true *P. angulatum,* whilst the fruit referred by Miq. *l. c.* to *P. angulatum* must rather be that of *P. bubalinum.*

34. P. CLYPEARIA, *Benth. ! in Hook. Lond. Journ.* iii. 209. Fusco-pubescens v. glabrescens. Pinnæ 4–6-jugæ; foliola pinnarum superiorum 10–12-juga, valde oblique ovata v. trapezoidea, obtusa v. acuta, 1–1$\frac{1}{2}$-pollicaria v. inferiora minora. Panicula terminalis. Flores in capitulo haud numerosi, pedicellati, tomentelli. Calyx $\frac{3}{4}$ lin., corolla 2–2$\frac{1}{2}$ lin. longa. Legumen circinatum, 6–8 lin. latum, margine exteriore sinuato, valvis varie tortis.

Adenanthera circinalis, DC. Prod. ii. 446, ad ic. Rumph. Amb. iii. t. 112.

Inga clypearia, Jack, in Mal. Misc. ii. vii. 78.

Mimosa trapezifolia, Roxb. Fl. Ind. ii. 546, non Vahl.

Inga dimidiata, Hook. et Arn. ! Bot. Beech. 181.

Hab. Tropical Asia : Malacca, the Archipelago, Penang, Singapore, Sumatra, Borneo, *Beccari,* n. 3745; South China.

35. P. MONTANUM, *Benth. ! in Hook. Lond. Journ.* iii. 209. Fusco-pubescens v. glabrescens. Pinnæ 7–12-jugæ; foliola pinnarum superiorum 12–20-juga, oblique ovato-oblonga, falcata, obtusiuscula v. acuta, 3–6 lin. longa. Panicula terminalis. Flores in capitulo haud numerosi, pedicellati, tomentelli. Calyx $\frac{3}{4}$ lin., corolla 2–2$\frac{1}{2}$ lin. longa. Legumen circinatum, margine exteriore sinuato, valvis varie tortis.

Inga montana, Span. ex Miq. Fl. Ind. Bat. i. i. 36, non Jungh.

Pithecolobium falcifolium, Hassk. Pl. Jav. Rar. 418.

Inga falciformis et *I. falcifolia*, Hassk. Hort. Bogor. 291, ex Hassk. *l. c.*
I. subfalcata, Zoll. in Flora, 1847, 706.

Hab. Tropical Asia: Khasiya, *Griffith*; Java; Borneo, *Motley*, *Beccari*, n. 2751.

Var.? MICROPHYLLA. Foliola sæpius 3–4 lin. longa (in forma typica sæpius 4–6 lin.).

Hab. Java, Philippine Islands, *Cuming*, n. 1918; and perhaps with still smaller narrower leaflets, Borneo, *Beccari*, n. 3730; our specimen insufficient for accurate determination.

This species appears to be very variable as to the petiolar glands of the leaves, sometimes all very small and stipulate, sometimes rather large aad sessile; and occasionally I have seen both on the same leaf.

Sectio 3. ABAREMOTEMO.

Arbores v. frutices elatiores, inermes. Stipulæ parvæ caducissimæ v. obsoletæ. Pinnæ pluri- v. multijugæ, rarius unijugæ. Foliola uni- pauci- v. multijuga. Pedunculi axillares v. ad apices ramorum conferti. Flores parvuli, in capitulo sæpius numerosi, staminum tubo incluso. Legumen planum, valde curvatum v. circinatum, valvis post dehiscentiam varie contortis. Seminum funiculus haud v. vix dilatatus.

This is the American representative of the section *Clypearia*, and scarcely differs from it in essential characters. The inflorescence is distinct from that of most species of *Clypearia*, but is represented in the *P. Junghuhnianum* and *P. pruinosum*, which, notwithstanding their geographical station, might, perhaps, be better placed in *Abaremotemo*.

* *Pinnæ* 1-*jugæ, petiolo alato. Foliola* 1-*juga*, 3–4-*pollicaria.*

36. P. FURCATUM, *Benth.! in Hook. Lond. Journ.* v. 106. Glabrum v. minute puberulum. Pinnæ unijugæ, petiolo communi rhachibusque late alatis; foliola 1-juga, oblique obovato-oblonga, obtuse acuminata, 3–4-pollicaria. Flores in capitulo ovoideo sessiles. Calyx $2\frac{1}{2}$ lin. longus, puberulus. Corolla 5 lin. longa, sericeo-villosa. Legumen ignotum.

Hab. Tropical America: South Mexico, on the banks of the river Teapa, *Linden*, n. 723.

This is the only species known to me with the leaves bipinnate as in *Pithecolobium*, but with the rhachis winged as in the majority of the simply pinnate *Ingæ* and *Affonseæ*.

** *Pinnæ* 1–2-*jugæ. Foliola* 1–3-*juga*, 2–4-*pollicaria, obtusa, coriacea, nitida.*

37. P. LEUCOPHYLLUM, *Spruce! Benth. in Mart. Fl. Bras. Mim.* Glabrum v. vix tomentellum. Pinnæ 1–2-jugæ; foliola 1-juga, obovato-oblonga, obtusa, coriacea, nitida, 3–4-pollicaria. Pedunculi $\frac{1}{2}$–1-pollicares. Flores in rhache brevissima subsessiles, glabri. Calyx 1 lin., corolla 2 lin. longa. Legumen junius glabrum, perfectum ignotum.

Hab. Tropical America: North Brazil, *Spruce.*

38. P. FILAMENTOSUM, *Benth.! in Hook. Lond. Journ.* v. 106. Glabrum. Pinnæ 1–2-jugæ; foliola 1–2-juga, oblique obovato-oblonga, obtusa, coriacea, nitida, 2–4- rarius 5-pollicaria. Pedunculi 2–3-pollicares. Flores in rhache semipollicari breviter pedicellati, glabri. Calyx $1\frac{1}{2}$–$2\frac{1}{2}$ lin., corolla 2–4 lin. longa. Legumen curvum, 6–8 lin. latum, glabrum.—*Fl. Bras. Mim.*

P. turbinatum, Benth.! in Hook. Lond. Journ. v. 106.
Inga crassifolia, Klotzsch! in Herb. Berol.
Hab. Tropical America: Brazil, prov. Bahia; Venezuela, *Otto.*

39. P. MICROCALYX, *Spruce! Benth. in Mart. Fl. Bras. Mim.* Glabrum v. minute puberulum. Pinnæ 1–2-jugæ; foliola 2–3-juga, oblique obovato-suborbiculata, obtusa, coriacea, nitida, 1½–2½-pollicaria. Pedunculi 2–3-pollicares. Flores in rhache 3–6 lin. longa pedicellati. Calyx vix 1½ lin., corolla fere 2 lin. longa. Legumen ignotum.
Hab. Tropical America: North Brazil.

40. P. OBOVALE, *Benth.* Glabriusculum. Pinnæ 2-jugæ. Foliola 2–4- rarius 5-juga, obovalia, obtusissima, coriacea, venosa, majora sub-2-pollicaria. Pedunculi 2–4-pollicares, rigiduli. Flores in rhache 3–4-lineari pedicellati, tomentelli. Calyx 2 lin., corolla 4 lin. longa. Legumen crasso-coriaceum, planum, valde incurvum fere circinatum, valvis 4–5 lin. latis.
Inga obovalis, A. Rich! Fl. Cub. i. 472.
Calliandra revoluta, Griseb.! Cat. Pl. Cub. 83.
Hab. Tropical America: Cuba, *De la Sagra, Wright,* n. 2399.

41. P. ASPLENIFOLIUM, *Griseb.! Cat. Pl. Cub.* 83. Glabrum. Pinnæ 2–4-jugæ; foliola 6–12-juga, oblique oblonga v. obovali-oblonga, obtusa, coriacea, nitida, 6–8 lin. longa. Pedunculi longiusculi. Flores in rhache breviter lineari longe pedicellati, glabri. Calyx fere 2 lin., corolla 4 lin. longa. Legumen glabrum, circinatum, margine exteriore leviter sinuato, valvis 3–4 lin. latis.
Hab. Tropical America: Cuba, *Wright,* n. 2403.

**** Pinnæ 1–4-jugæ. Foliola 2–4-juga, ovata v. oblonga, acuminata, 1- pluri-pollicaria.*

42. P. LÆTUM, *Benth. in Hook. Lond. Journ.* iii. 203. Ferrugineo-villosulum. Pinnæ 1- rarissime 2-jugæ; foliola 1-juga, ovali- v. oblongo-elliptica, acuminata, majora semipedalia, utrinque viridula. Flores in capitulo sessiles, apice villosi. Calyx 1 lin., corolla fere 3 lin. longa. Legumen curvum, margine exteriore sinuato, semipedale, 6–8 lin. latum.—*Fl. Bras. Mim.*
Inga læta, Pœpp.! et Endl. Nov. Gen. et Sp. iii. 80.
Pithecolobium polycarpum, Pœpp.! et Endl. *l. c.* 81.
Hab. Tropical America: Cayenne, *Martius*; Surinam, *Focke* (distributed by Miquel under the name of *I. capitata,* Desv.); North Brazil, Eastern Peru.

43. P. COCHLEATUM, *Mart.! Herb. Fl. Bras.* 115. Glabrum. Pinnæ 1–2-jugæ; foliola 2–3-juga, ex ovato oblongo-lanceolata, acuminata, supra nitida, subtus glaucescentia v. pallida, 1–2-pollicaria. Flores in capitulo breviter pedicellati. Calyx 1 lin., corolla 2 lin. longa. Legumen valde curvatum v. circinatum, margine exteriore sinuato, 4–9 lin. latum.—*Benth. in Fl. Bras. Mim.*
Inga cochleata, Willd. Spec. iv. 1020.
Mimosa cochleata, Poir. Dict. Suppl. i. 45.
Hab. Tropical America: Brazil, prov. Para.

44. P. AUAREMOTEMO, *Mart.! Herb. Fl. Bras.* 115. Glabrum v. minute glanduloso-

puberulum. Pinnæ 2–3- rarius 4-jugæ; foliola 2–3-juga, ovata v. rhombea, acuta acuminata v. rarius obtusa, concoloria, 1–2-pollicaria, paucivenia. Flores in capitulo sessiles, glabri. Calyx 1 lin., corolla 3 lin. longa. Legumen circinatum v. gyris 2–3 cochleatum, $1\frac{1}{2}$ poll. diametro, valvis ad 6 lin. latis.—*Benth. in Fl. Bras. Mim.*

Inga nandinæfolia, DC. ! Prod. ii. 440.

Mimosa vaga, Vell. Fl. Flum. Ic. xi. t. 13.

Mimosa cochliocarpa, Gomez, Obs. Pl. Bras. 30 (34?), t. 4. f. 3; DC. Prod. ii. 430.

Inga cochlocarpos, Mart. ! Reise, i. 549.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Bahia, Pernambuco, and Ceara.

45. P. CAMPESTRE, *Spruce ! Benth. in Mart. Fl. Bras. Mim.* Glabrum v. vix minute puberulum. Pinnæ 2–4-jugæ: foliola 2–5-juga, ovata, acuminata, basi late rotundata, $1\frac{1}{2}$–$2\frac{1}{2}$-pollicaria, utrinque læte virentia, venosa. Flores in capitulo subsessiles, glabriusculi. Calyx $1\frac{1}{2}$ lin., corolla fere 4 lin. longa, Legumen circinatum, ad 3 poll. diametro, valvis $\frac{3}{4}$ poll. latis.

Hab. Tropical America: North Brazil.

******** *Pinnæ plurijugæ. Foliola pluri-* (4–12-)*juga, pleraque* $\frac{1}{2}$–1*-pollicaria, valde obliqua, rhombea v. falcata, obtusa.*

46. P. TRAPEZIFOLIUM, *Benth. ! in Hook. Journ. Bot.* ii. 142, *Lond. Journ.* iii. 204. Ferrugineo-tomentellum v. glabratum. Pinnæ 2–4-jugæ; foliola 4–8-juga, pleraque rhombeo-ovata, coriacea, subpollicaria, subtus puberula. Flores in capitulo sessiles, tomentosi. Calyx 1 lin., corolla 2 lin. longa. Legumen minute puberulum, circinatum, ad $1\frac{1}{2}$ poll. diametro, valvis 4–5 lin. latis.—*Fl. Bras. Mim.*

Mimosa trapezifolia, Vahl ! Ecl. iii. 36, t. 28.

Inga trapezifolia, DC. Prod. ii. 441.

Mimosa vaga, Aubl. Pl. Gui. ii. 945, non Linn.

Acacia Jupunba, Willd. ! Spec. iv. 1067.

Mimosa Jupunba, Poir. Dict. Suppl. i. 70.

Mimosa atakta, Steud. ! in Flora, 1843, 758.

Hab. Tropical America: North Brazil, Guiana, Trinidad, Dominica, Columbia, *Moritz*, n. 1457.

47. P. LUSORIUM, *Benth. ! in Hook. Lond. Journ.* iii. 204. Ferrugineo-tomentellum. Pinnæ 2–5-jugæ; foliola 3–6-juga, oblique rhombeo-ovata, coriacea, utrinque glabra, majora 1–$1\frac{1}{2}$-pollicaria. Flores in capitulo ovoideo breviter pedicellati, minute puberuli. Calyx fere 2 lin., corolla 4 lin. longa. Legumen (ex icone Velloziana) planum, curvum, valvis demum contortis.—*Fl. Bras. Mim.*

Mimosa lusoria, Vell. Fl. Flum. Ic. xi. t. 14.

Inga brachystachya, DC. ! Prod. ii. 440.

Calliandra obovata, Benth. in Hook. Lond. Journ. iii. 101.

Hab. Tropical America: Brazil, prov. Sao Paulo and Minas Geraes, and perhaps, a small-leaved variety, Rio Janeiro.

48. P. FERRUGINEUM, *Benth. ! in Hook. Lond. Journ.* iii. 216. Ferrugineo-tomentosum. Pinnæ 2–3-jugæ; foliola 6–10-juga, oblique rhombeo-ovata v. oblonga, coriacea,

reticulata, glabra v. subtus puberula, ½–1-pollicaria. Flores in capitulo ovoideo-globoso subsessiles, ferrugineo-tomentelli. Calyx 4 lin., corolla 5½ lin. longa. Legumen villosum, arcuatum v. circinatum, valvis 6–8 lin. latis contortis.

Hab. Tropical America: British Guiana, *Schomburgk.*

49. P. RHOMBEUM, *Benth. ! in Hook. Lond. Journ.* iii. 217. Ferrugineo-tomentellum. Pinnæ 6–8-jugæ; foliola 8–12-juga, oblique rhombea, vix coriacea, subglabra, majora 8–9 lin. longa. Flores in capitulo globoso sessiles, ferrugineo-puberuli. Calyx 1 lin., corolla 3 lin. longa. Legumen curvum, coriaceum, venosum, ad 5-pollicare, 8–9 lin. latum, planum.—*Fl. Bras. Mim.*

Hab. Tropical or subtropical South America: South Brazil.

It does not appear whether the valves of the pod, after separating, become twisted or not; and the place of the species, whether in *Abaremotemo* or in *Samanea* is uncertain. It appears to be nearly allied to some of the foregoing; but the foliage is more like that of the West-Indian *P. micradenium*, with pale-coloured rather thin leaflets.

***** *Pinnæ pluri-* (3–8-)*jugæ. Foliola multi-* (10–30-)*juga, rarius* 6–8-*juga, in sp.* 2 *prioribus membranacea ad* 6 *lin. longa, in* 2 *sequentibus dimidio minora.*

50. P. FLORIBUNDUM, *Spruce ! Benth. in Mart. Fl. Bras. Mim.* Ferrugineo-tomentellum. Pinnæ 4-6-jugæ; foliola 12–20-juga, oblique oblonga, obtusa, semipollicaria, membranacea, subglabra. Flores in capitulo globoso brevissime pedicellati, minute pubescentes. Calyx fere 2 lin. longus, corolla duplo longior. Legumen ignotum.

Hab. Tropical America: North Brazil, *Spruce.*

51. P. MICRADENIUM, *Benth. ! in Hook. Lond. Journ.* iii. 217. Ferrugineo-tomentellum. Pinnæ 3–8-jugæ; foliola 6–12-juga, oblique rhombeo-obovata v. oblonga, 6–9 lin. longa, membranacea, subtus puberula. Flores in capitulo subgloboso v. elongato breviter pedicellati. Calyx 1–1¼ lin., corolla 2½ lin. longa. Legumen glabrum, curvum v. fere circinatum, margine exteriore sinuato.—*Griseb. Fl. Brit. W. Ind.* 226.

P. Brongniartii, Duchass. et Walp. ! in Flora, 1853, 232.

Hab. Tropical America: West Indies, Jamaica, Dominica, Guadeloupe.

52. P. AURICULATUM, *Benth. ! in Hook. Lond. Journ.* iii. 217. Ferrugineo-tomentellum. Pinnæ 5–7-jugæ; foliola 6–12-juga, oblique rhombea, obtusa, hinc obtuse auriculata, 3–4 lin. longa, supra nitida, subtus pallide rufescentia. Flores in capitulo globoso sessiles. Calyx ¾ lin., corolla 2 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: North Brazil.

53. P. LANGSDORFII, *Benth. ! in Hook. Lond. Journ.* iii. 205. Ferrugineo-tomentellum. Pinnæ 5–7-jugæ; foliola 15–25-juga, oblonga, obtusa v. acutiuscula, ad 3 lin. longa, supra nitida, subtus albida. Flores in capitulo globoso rarius oblongo sessiles v. breviter pedicellati. Calyx 1-1½ lin., corolla 2–2½ lin. longa. Legumen arcuatum, glabrum, 4 lin. latum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Sao Paulo, Rio Janeiro, and Minas Geraes.

Sectio 4. Samanea.

Arbores v. frutices inermes v. rarissime spinis axillaribus armati. Pinnæ pluri- v. rarius multijugæ. Foliola uni- pauci- v. multijuga. Legumen rectum arcuatum v. circinatum, nunc planum et rigide coriaceum v. carnosum, rarius tenue, nunc crassum v. subteres, indehiscens v. tardius in valvas nec tortas nec elastice dissilientes secedens, interdum moniliforme v. articulatum. Pedunculi axillares v. ad apices ramorum racemosi v. paniculati, in fasciculo haud unilateraliter suprapositi. Flores in capitulo globoso sessiles v. pedicellati.

Series 1. Subarticulatæ. *Legumina nunc crassa inter semina linea transversa depressa notata, nunc tenuia et plana, sæpissime demum in articulos monospermos subquadratos divisa. Inermes excepto* P. umbellato.

* *Gerontogeæ.*

54. P. umbellatum, *Benth.! in Hook. Lond. Journ.* iii. 202. Puberulum. Spinæ hinc inde axillares validæ. Pinnæ 1–2-jugæ; foliola 4–10-juga cum exteriore prope basin rhacheos, oblique oblonga, obtusa, $\frac{1}{2}$–$\frac{3}{4}$-pollicaria. Pedunculi axillares v. ad nodos fasciculati, tenues. Flores in capitulo pedicellati, glabriusculi. Calyx 1–$1\frac{1}{2}$ lin., corolla 3–$3\frac{1}{2}$ lin. longa. Legumen curvum, crassum, 3–4-pollicare, $\frac{3}{4}$ poll. latum, inter semina transverse depressum.

Mimosa umbellata, Vahl! Symb. ii. 103.
Inga umbellata, Willd. Spec. iv. 1027.
Mimosa concordiana, Roxb. Fl. Ind. ii. 556.
Inga concordiana, DC. Prod. ii. 441.
Mimosa nitida, Vahl, Symb. ii. 163.
Acacia nitida, Willd. Spec. iv. 1086.
Inga Kœnigii, W. et Arn. Prod. Fl. Penins, 269.
Pithecolobium nitidum, Benth.! in Hook. Lond. Journ. iii. 202.

Hab. Tropical Asia: East-Indian peninsula and Ceylon.

The specimen in Herb. Vahl marked *Mimosa nitida* is there said to be from Ceylon. It appeared to me when I saw it many years ago to belong to this species rather than to *Calliandra geminata*; but I have had no means of determining it positively.

55. P. moniliferum, *Benth.! in Hook. Lond. Journ.* iii. 211. Tomentellum. Pinnæ 1–2-jugæ; foliola 4–7-juga, oblique obovata v. ovali-oblonga, obtusa, supra nitida et venosa, terminalia 1–$1\frac{1}{2}$ v. fere 2 poll. longa, cætera minora. Pedunculi axillares. Flores in capitulo longiuscule pedicellati, glabriusculi. Calyx 1 lin., corolla ad 2 lin. longa. Legumen curvum v. rarius rectum, 3–4-pollicare, $\frac{3}{4}$ poll. latum, crassum, fere lignosum, inter semina transverse depressum demumque sæpe divisum.—*Benth. Fl. Austral.* ii. 424.

Inga moniliformis, DC. Prod. ii. 440; Dene. Herb. Tim. Descr. 131.
Inga umbellata, Zoll. in Flora, 1847, 706, non Vahl.
Cathormion moniliferum, Hassk. Hort. Bogor. Descr. 272.
Albizzia monilifera, F. Muell. in Trim. Journ. Bot. 1872, 10.
Mimosa montana, Hassk. Cat. Hort. Bog. 290, non Kunth.
Pithecolobium umbellatum, Miq. Fl. Ind. Bat. i. i. 37, quoad plantam Archipelagi, non Benth.

Hab. Tropical Asia and Australia: Java, Timor, north coast of Australia.

56? P. Pervilleanum, *Benth.*, sp. n. Tomentellum. Pinnæ 2–3-jugæ; foliola 5–6-juga, petiolulata, oblique ovalia ovali-oblonga v. subrhombea, obtusa, $\frac{3}{4}$–$1\frac{1}{4}$-pollicaria, tenuiter subcoriacea, glabra v. ad venas tomentella, pennivenia, venulosa. Pedunculi axillares, 2–3ni, 1–$1\frac{1}{2}$-pollicares. Flores in capitulo sessiles, appresse pubescentes. Calyx 1 lin., corolla $2\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. Madagascar, northwest coast, *Perrillé*, n. 327.

Until the fruit is known, the place of this species, very unlike any other Old-World one, cannot be determined on; but it appears to be allied in foliage to the preceding, in flowers to the following species.

57. P. altissimum, *Oliv.! Fl. Trop. Afr.* ii. 364. Ferrugineo-puberulum. Pinnæ 5–6-jugæ; foliola 10–25-juga, lineari-oblonga, subfalcata, glabra, 4–6 lin. longa. Pedunculi axillares. Flores in capitulo sessiles, glabri. Calyx $1\frac{1}{4}$ lin., corolla 3 lin. longa. Legumen valde curvum v. 2–3-gyrosum, dum extensum $\frac{1}{2}$–1-pedale, 6–9 lin. latum, crassum, inter semina transverse depressum.

Albizzia altissima, Hook. f. Fl. Nigr. 332.

Hab. West tropical Africa.

There is in the Kew herbarium a specimen from West tropical Africa gathered by Mann on the Bagroo river, which appears to be a distinct species allied to the last, with much smaller leaflets, and more numerous pinnæ, but insufficient to justify its description as a species.

** *Americanæ.*

58. P. marginatum, *Spruce! Benth. in Mart. Fl. Bras. Mim.* Glabrum. Pinnæ 1-jugæ; foliola 3–4-juga, ovato-oblonga v. falcato-obovata, obtusa, coriacea, nitida, venosa, 1–2-pollicaria. Pedunculi ad apices ramorum plures. Flores in capitulo plerique longe pedicellati. Calyx 1 lin., corolla 3 lin. longa. Legumen arcuatum, crassiusculum, 4–6-pollicare, 6–7 lin. latum.

Calliandra marginata, Benth.! in Spruce Pl. Exs.

Hab. Tropical America: North Brazil.

59. P. panurense, *Spruce! Benth. in Mart. Fl. Bras. Mim.* Glabrum. Pinnæ 1-jugæ; foliola 4–6-juga, oblique subrhombea v. oblonga, $\frac{1}{2}$–1-pollicaria, v. terminalia obovalia et pollicaria, nitida, subtus pallida. Pedunculi ad apices ramorum plura. Flores in capitulo longiuscule pedicellati. Calyx fere 2 lin., corolla $3\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. Tropical America: North Brazil.

60. P. Daulense, *Spruce!*, sp. n. Glabrum. Pinnæ 1-jugæ; foliola 3–4-juga, oblique ovalia v. ovali-oblonga, obtusissima, $\frac{3}{4}$–1-pollicaria, nitida. Pedunculi breves, tenues, in racemis ad apices ramorum plurimis conferti. Flores sessiles, glabri. Calyx $\frac{1}{2}$ lin., corolla $1\frac{1}{2}$ lin. longa. Legumen glabrum, rectum v. curvum, sub-4-pollicare, ad 6 lin. latum.

Hab. Tropical America: savannahs on the Daule river near Guayaquil, *Spruce*, n. 6330.

Arbor ramosissima 30-pedalis, caudice valido, quoad folia et legumina præcedentibus affinis, floribus parvis sequentium, inflorescentia ab omnibus diversa. Ramuli et rhaches foliorum hinc inde minutissime puberuli, cæterum ex omni parte glabra. Foliorum petiolus communis 3–6 lin. longus, glandula minuta

v. obsoleta; pinnarum rhaches 1–2-pollicares. Foliola tenuiter coriacea, pennivenia et basi 3–4-nervia, venulosa. Racemi ad apices ramorum plurimi, erecti, 3–4-pollicares, densiflori; pedunculi secus rhachin fasciculati, 2–4 lin. longi. Capitula parva. Legumen ut in *P. marginato* crassiuscule coriaceum, inter semina lineis transversis insigniter depressis notatum, et ut videtur ibidem tardius in articulos monospermos secedens v. omnino indehiscens.

61. P. CORYMBOSUM, *Benth.! in Hook. Lond. Journ.* iii. 221. Glabrum v. tomentellum. Pinnæ 2–5-jugæ; foliola 8–12-juga, oblique subrhombeo-oblonga, obtusissima, venosa, $\frac{1}{2}$–$\frac{3}{4}$ poll. longa v. terminalia fere pollicaria. Pedunculi axillares et ad apices ramorum corymbosi. Flores in capitulo pedicellati, puberuli. Calyx 1–$1\frac{1}{4}$ lin., corolla infundibuliformis 2–$2\frac{1}{2}$ lin. longa. Legumen planum, coriaceum, haud crassum, 2–4-pollicare, 4–5 lin. latum, inter semina transverse lineatum et demum sæpius divisum.—*Fl. Bras. Mim.*

Mimosa corymbosa, Rich. in Act. Soc. Hist. Nat. Par. 1792, 113 ex diagnosi brevi.

Inga trapeziformis, Steud.! in Flora, 1843, 759.

Hab. Tropical America: North Brazil, Surinam, Cayenne, and British Guiana.

62. P. BLANCHETI, *Benth. in Mart. Fl. Bras. Mim.* Vix puberulum. Folia et inflorescentia *P. corymbosi.* Calyx $\frac{3}{4}$ lin. Corolla $1\frac{1}{2}$ lin. longa, fere ad basin 5-fida. Legumen ignotum.

Enterolobium Blancheti, Benth.! in Hook. Lond. Journ. iii. 224.

Hab. Tropical America: Brazil, prov. Bahia.

Series 2. Carnosæ. *Legumen crasso-carnosum, compressum v. teres, continuum v. moniliforme nec articulatum, indehiscens v. tardius bivalve, inerme. Pedunculi axillares.*

63. P. SAMAN, *Benth. in Hook. Lond. Journ.* iii. 216. Pubescens. Pinnæ 2–4-jugæ; foliola 2–8-juga, oblique ovato-oblonga v. suborbiculata, majora sesquipollicaria, vix coriacea, subtus pubescentia. Pedunculi 4–5-pollicares. Flores in capitulo breviter pedicellati. Calyx 3 lin. longus, pubescens. Corolla 5 lin. longa, sericeo-villosa. Legumen sessile, rectum, crassum, coriaceo-carnosum, indehiscens, 6–8-pollicare, $\frac{1}{2}$–1 poll. latum, compressum v. subteres.—*Fl. Bras. Mim.*

Mimosa Saman, Jacq. Fragm. 15, t. 9.

Inga Saman. Willd. Spec. iv. 1024.

Calliandra Saman, Griseb. Fl. Brit. W. Ind. 225.

Inga salutaris, H. B. et K.! Nov. Gen. et Sp. vi. 304.

I. cinerea, Humb. et Bonpl.! in Willd. Spec. iv. 1024.

Pithecolobium cinereum, Benth.! in Hook. Lond. Journ. iii. 216.

Mimosa pubifera, Poir. Dict. Suppl. i. 47.

Calliandra tubulosa, Benth.! in Hook. Lond. Journ. iii. 101.

Hab. Tropical America: North Brazil, Eastern Peru, Columbia, Central America, Jamaica; but in the latter station, and perhaps some others, originally planted.

In Spruce's specimens from Eastern Peru the fruit before attaining its full size, though flat, shows a raised line along the centre of each face, and, when ripe, becomes quite terete, or, according to Spruce thicker than broad. In the Caracas specimens of which I have seen the fruit, it is broader and very thick, but remains flattened. I can find no other difference in the specimens, which also resemble at first sight those of *Albizzia Lebbek,* and of *Lysiloma Guachapele,* with which they are sometimes confounded when in flower only.

64. P. PEDICELLARE, *Benth.! in Hook. Lond. Journ.* iii. 219. Glabrum v. ferrugineo-tomentellum. Pinnæ 6–10-jugæ; foliola 20–30-juga, oblongo-linearia, obtusa, 3–4 lin. longa, demum coriacea. Pedunculi axillares. Flores in capitulo pedicellati. Calyx vix linea longior, corolla 3–4 lin. longa. Legumen rectum, crassum, 3- (4-?) pollicare, $\frac{3}{4}$ poll. latum, continuum, indehiscens, inter margines crassos transverse venosum.—*Fl. Bras. Mim.*

Inga pedicellaris, DC.! Prod. 441.

Hab. Tropical America: North Brazil, Cayenne.

Mimosa chrysantha, Vahl, Ecl. ii. 38 (*Acacia chrysantha,* DC. Prod. ii. 471), from Cayenne, *v. Rohr,* is probably this species or one closely allied to it. When I saw the specimen in Vahl's herbarium, it appeared to me to be the Jamaican *P. filicifolium*; but that is not a Cayenne plant, and agrees less with Vahl's description than the nearly allied Cayenne *P. pedicellare*. The only objection is Vahl's express statement "Petiolus eglandulosus," whereas in *P. pedicellare* there is usually a prominent gland about halfway from the base to the lowest pair of pinnæ. De Candolle has reversed the numbers respectively assigned by Vahl to the pinnæ and the leaflets; but that is owing to Vahl's having, in common with many of the older botanists, always given the name of *foliola* to the primary divisions of the leaf now called *pinnæ,* and that of *pennulæ* to the secondary segments now always termed *foliola* or *leaflets.*

65. P. FILIPES, *Benth.* Glabrum. Pinnæ 2-jugæ; foliola 2–4-juga, obovata, obtusissima, coriacea, pollicaria v. paullo longiora. Pedunculi axillares, tenues, recurvi, 3–4-pollicares. Flores in capitulo globoso sessiles, tenues. Calyx ad 2 lin. longus. Corolla fere semipollicaris. Legumen semipedale v. longius, leviter arcuatum, $\frac{3}{4}$ poll. latum, crassum, leviter torulosum.

Inga filipes, Vent. Choix, t. 38.

Hab. Tropical America: San Domingo.

66. P.? BERTOLONII, *Benth.* Pubescens. Pinnæ 2-jugæ; foliola 2-juga, elliptica, obtusa, basi obliqua, pilosa. Spicæ capitatæ, racematæ, solitariæ v. geminatæ, altera pedicellata altera subsessili. Legumen compressum, torulosum, falcatum, 3–4-spermum, rubens, velutinum.

Mimosa monilifera, Bertol. Fl. Guatem. 41.

Hab. Tropical America: Guatemala, *Velasquez.*

I have not seen this plant; but from Bertoloni's very incomplete character, from which I have extracted the essential points, it would appear to be nearly allied to the preceding and following species.

67. P. SOPHOROCARPUM, *Benth.! in Benth. et Hook. Gen. Pl.* i. 598. Ferrugineo-puberulum, glabrescens. Pinnæ 1–5-jugæ. Foliola 5–12-juga, oblique oblonga v. subrhombea, obtusa v. acuta, maxima 2-pollicaria, minora vix semipollicaria. Pedunculi axillares, $1\frac{1}{2}$–2-pollicares, tenues. Flores in capitulo sessiles, glabri. Calyx linea brevior, corolla $2\frac{1}{2}$ lin. longa. Legumen teres, carnosum, inter semina valde contractum, monilibus (ad 9) ovoideo-globosis subsemipollicaribus.

Hab. Tropical America: "New Spain," *Herb. Pavon*; Costa Rica on Mount Pantarmo in Segovia, and at Candelaria, *Œrsted.*

Species legumine, fere *Sophoræ Japonicæ,* distinctissima, an frutex an arbor haud patet. Ramuli tenues, teretes, pube tenui demum evanida. Stipulæ parvæ, caducæ. Folia valde variant, pinnis foliolisque nunc confertis sat numerosis parvis, nunc in ramulis laxioribus; pinnæ 1–2-jugæ elongatæ rhachibus

subsemipedalibus, foliolis paucis, 1–2-pollicaribus. Glandula inter pinnas parvæ, nunc minutæ. Foliola rigide membranacea v. tenuiter coriacea, sæpe subfalcata, acuminata v. obtusa, supra nitidula. Flores tubulosi. Stamina numerosa, corolla duplo saltem longiora, tubo corolla incluso.

68. P. MICRANTHUM, *Benth.*, sp. n. Glaberrimum. Pinnæ 1-jugæ; foliola 8–12-juga, oblique oblonga, obtusissima, coriacea, nitida, $2\frac{1}{2}$–4 lin. longa. Pedunculi axillares, $\frac{1}{2}$–$\frac{3}{4}$-pollicares. Flores in capitulo sessiles, glabri. Calyx vix $\frac{1}{4}$ lin., corolla 1 lin. longa. Legumen curvum, carnosulum, subteres, inter semina hinc inde contractum, $1\frac{1}{2}$-pollicare, 3 lin. latum.

Hab. Tropical America: San Domingo, *Schomburgk*, no. 149 (*Herb. Berol.*)

Ramuli breves, verruculosi et forte visciduli. Folia siccitate nigricantia, petiolo communi 2–3 lin. longo. Pinnæ $1\frac{1}{2}$–2-pollicares. Glandulæ scutellatæ inter pinnas et parvæ inter foliola parum superiorum. Foliola obliqua at vix falcata, costa centrali supra in statu sicco nigra, subtus fuscescentia. Pedunculi in axillis sæpius gemini. Corolla tubulosa, apice 5-dentata. Stamina numerosa, corolla dimidio longiora, basi in tubum brevem valde inæqualiter monadelpha. Legumen ei *P. filicifolii* subsimile.

69. P. FILICIFOLIUM, *Benth.! in Hook. Lond. Journ.* iii. 205. Ferrugineo-tomentellum. Pinnæ 8–12-jugæ; foliola 20–30-juga, oblique falcato-oblonga, obtusiuscula, 3–4 lin. longa, glabrescentia. Pedunculi axillares v. supra-axillares, 2–3-pollicares. Flores in capitulo globoso sessiles, apice sæpius pubescentes. Calyx 1 lin., corolla 3 lin. longa. Legumen junius tomentellum, mox glabratum, teretiusculum, carnosulum, inter semina contractnm, arcuatum v. contortum, 2–3-pollicare, 4–6 lin. latum, demum bivalve.—*Griseb. Fl. Brit. W. Ind.* 226.

Mimosa filicifolia, Lam. Dict. i. 13?

M. arborea, Linn. Spec.1503, pro parte; Swartz, Obs. 390.

Acacia arborea, Willd. Spec. iv. 1064, pro parte; Macfad.! Fl. Jam. 320.

Hab. Tropical America: W. Indies, Southern Mexico and Central America, Jamaica, San Domingo, Cuba, Xalapa, *Galeotti*; Nicaragua, *Œrsted*.

I have now some doubts whether I was correct in referring this to Lamarck's *M. filicifolia*, which is but imperfectly described. At the same time there are objections to the substituting for it the specific name *arboreum* as Linnean. Independently of the inconvenience of giving that name to one only out of nearly one hundred arborescent species of the genus, it was very vaguely applied by early botanists. There is no doubt that Linnæus had partly in view the tree described and figured by Sloane (ii. t. 182. f. 1, 2), which is the present species; but unfortunately he took his description from the *Acacia villosa*, which represents it in his herbarium; and Miller and others of Linnæus's contemporaries applied the name *arborea* to the *Albizza Julibrissin*. On the whole, therefore, the best course appears to be to follow Grisebach in keeping up the name of *Pithecolobium filicifolium*.

Series 3. CORIACEÆ. *Legumen planum, rigide coriaceum, indehiscens v. tardius 2-valve, inerme. Pedunculi axillares v. summi breviter racemosi. Flores sessiles, nunc* $\frac{1}{4}$–$\frac{1}{2}$ *poll. longi, nunc ultrapollicares.*

70. P. SIMABIFOLIUM, *Spruce! Benth. in Mart. Fl. Bras. Mim.* Glabrum. Pinnæ 1-jugæ; foliola sub-2-juga, obovata v. oblonga, obtusissima, coriacea, nitida, majora $1\frac{1}{2}$-pollicaria. Calyx 2 lin. longus. Corolla semipollicaris. Legumen glabrum, 4-pollicare, $\frac{3}{4}$–1 poll. latum.

Hab. Tropical America: Venezuela, near the Brazilian borders on the river Pacimoni, *Spruce*.

71. P. LINDSEIFOLIUM, *Spruce ! Benth. in Mart. Fl. Bras. Mim.* Alte scandens, glabrum v. leviter tomentellum. Pinnæ 3–4-jugæ; foliola 8–14-juga, falcato-rhombea, obtusa, coriacea, nitida, $\frac{3}{4}$–1-pollicaria. Flores tomentelli. Calyx 3–4 lin., corolla 1–$1\frac{1}{4}$ poll. longa. Staminum tubus exsertus. Legumen ignotum.

Hab. Tropical America: North Brazil.

72. P. SPRUCEANUM, *Benth.! in Mart. Fl. Bras. Mim.* Alte scandens, glabrum v. minute tomentellum. Pinnæ 6–9-jugæ; foliola 12–18-juga, falcato-rhombea, incurvo-acuta; coriacea, nitida, 6–9 lin. longa. Flores tomentelli. Calyx subpollicaris, corolla 2 poll. longa. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: North Brazil.

73. P. LONGIFLORUM, *Benth.! in Hook. Lond. Journ.* v. 107. Alte scandens, ferrugineo-tomentellum. Pinnæ 4–8-jugæ; foliola 12–20-juga, oblongo-falcata, obtusiuscula, coriacea, nitida, 6–10 lin. longa. Flores minute tomentelli. Calyx ad 3 lin. longa, corolla pollicaris. Staminum tubus longe exsertus. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: North Brazil.

The three preceding species are all evidently allied to *P. adiantifolium*, but are all described as tall woody climbers, whilst *P. adiantifolium* is said to be a loosely branched shrub or small tree; and besides minor differences, they have the staminal tube much longer.

74. P. ADIANTIFOLIUM, *Benth.! in Hook. Lond. Journ.* iii. 218. Frutescens v. arboreum, glabrum v. vix puberulum. Pinnæ 2–8-jugæ; foliola sæpius 10–12-juga, oblique oblonga v. linearia, coriacea, nitida, subpollicaria. Flores tomentelli. Calyx 4–5 lin. longus. Corolla pollicaris. Staminum tubus corollam breviter superans. Legumen rectum v. valde curvum, semipedale, 1 poll. latum, vix minute tomentellum.—*Fl. Bras. Mim.*

Inga adiantifolia, Kunth, Mim. 66. t. 21.

I. discolor, Humb. et Bonpl. in Willd. Spec. iv. 1023.

Mimosa discolor, Poir. Dict. Suppl. i. 46.

Hab. Tropical America: North Brazil, Guiana, and Venezuela.

Pithecolobium Miquelianum, Meissn. in Linnæa, xxi. 250, from Surinam, *Kegel*, n. 1162, would appear from his description to be a rather smaller-flowered variety of this species, such as occurs amongst Hostmann's specimens.

75. P. KEGELII, *Meissn. in Linnæa*, xxi. 249? Parce pilosulum. Pinnæ 4–6-jugæ; foliola 10–18-juga, oblongo-rhombea, subfalcata, $\frac{1}{2}$–1-pollicaria, membranacea, glabra, pallide virentia. Pedunculi axillares, vix 3 lin. longi. Flores sessiles. Calyx tubulosus, 6–7 lin. longus. Corolla pollicaris v. paullo longior, sericeo-pubescens. Staminum tubus vix exsertus. Legumen ignotum.

P. stipellatum, Bernh. Pl. Kappl. exs.

Hab. Tropical America: Surinam, *Kegel*, n. 1173, *Kappler*, n. 1341.

Of this I have only seen an imperfect specimen of Kappler's, agreeing well with Meissner's character. It has the principal characters of the several foregoing species, especially of *P. lindseifolium*; but the leaflets are thin and of a pale-green, not coriaceous and shining, as in the four preceding species; and the staminal tube much shorter.

76. P. INCURIALE, *Benth. in Hook. Lond. Journ.* iii. 218. Ferrugineo-villosum. Pinnæ

6–10-jugæ; foliola 15–25-juga, oblique oblongo-linearia, nitidula, ad 3 lin. longa, glabriuscula v. ciliata. Flores villosi. Calyx $1\frac{1}{2}$ lin., corolla 3 lin. longa. Legumen rectum v. curvum, tenuissime tomentoso-rugosum, 4–8-pollicare, $\frac{3}{4}$–$1\frac{1}{4}$ poll. latum.—*Fl. Bras. Mim.*

Mimosa incurialis, Vell. Fl. Flum. Ic. xi. t. 24.

Pithecolobium Martianum, Benth.! in Hook. Lond. Journ. iii. 218.

Hab. Tropical America: Brazil, prov. Rio Janeiro and Minas Geraes.

Series 4. Parvifloræ. *Legumen planum, rectum v. curvulum, tenuiter coriaceum, indehiscens v. tardius bivalve. Capitula parva, ad apices ramorum racemoso-paniculata. Flores sessiles, 2 lin. longæ v. breviores.*

77. P. TRIFLORUM, *Benth.* Glabrum. Pinnæ 1-jugæ; foliola 3–4-juga, oblique obovali-oblonga, obtusa, coriacea, 6–9 lin. longa. Capitula pedunculata, pauciflora, breviter fasciculato-racemosa v. paniculata. Calyx 1 lin., corolla 2 lin. longa. Legumen ignotum.

Mimosa triflora, Herb. Pav.!

Inga triflora, G. Don! Gen. Syst. ii. 394.

Hab. Tropical America: Guayaquil, *Tafalla, Herb. Pav. in Herb. Boiss.*

Habitus sectionis *Unguis-Cati,* sed stipulæ spinescentes omnino desunt. Foliorum petiolus communis raro semipollicaris, pinnarum rhaches $1\frac{1}{2}$-pollicares, rigidæ. Glandulæ parvæ. Foliola a basi pluri-nervia, venosa, subtus rufescentia. Pedunculi breves. Corolla latiuscule campanulata, 4-fida, glabra. Staminum tubus vix exsertus.

78. P. MULTIFLORUM, *Benth.! in Hook. Lond. Journ.* iii. 220. Glabrum v. puberulum. Pinnæ 1–4-jugæ; foliola 6–10-juga, oblongo-falcata, subdimidiata, 6–10 lin. longa, costa submarginali. Capitula breviter pedunculata, racemoso-paniculata. Calyx minutus, corolla vix lineam longa. Legumen rectum, planum, maturum ignotum.—*Fl. Bras. Mim.*

Acacia multiflora, H., B. et K.! Nov. Gen. et Sp. vi. 277.

A. subdimidiata, Splitg. Pl. Nov. Surin. 18.

A. inundata, Mart.! Reise, i. 555.

Hab. Tropical America: Brazil, prov. Minas Geraes and Bahia, North Brazil, Guiana, Columbia, Peru, Central America.

Acacia multiflora, Spreng. Syst. iii. 142 (a name changed in his Index to *A. polyantha*), is most probably the same species as Kunth's homonym.

79. P. POLYCEPHALUM, *Benth. in Hook. Lond. Journ.* iii. 219. Ferrugineo-tomentellum. Pinnæ 8–10-jugæ; foliola 12–25-juga, falcato-oblonga, 3–4 lin. longa, sæpius puberula, costa parum excentrica. Capitula pedunculata, racemoso-paniculata. Calyx $\frac{3}{4}$ lin., corolla fere 2 lin. longa. Legumen rectum v. falcatum, 3–5-pollicare, ad $\frac{3}{4}$ poll. latum, ferrugineo-tomentellum, ut videtur indehiscens.—*Fl. Bras. Mim.*

Mimosa terminalis, Vell. Fl. Flum. Ic. xi. t. 30.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Bahia, and Minas Geraes, Eastern Peru, *Spruce,* n. 4407; British Guiana, also Bogota, *Triana.*

80. P. NIOPOIDES, *Spruce!, Benth. in Fl. Bras. Mim.* Cano-puberulum, glabrescens. Pinnæ 6–8-jugæ; foliola ad 30-juga, lineari-falcata, $1\frac{1}{2}$–2 lin. longa, coriacea, nitidula.

costa fere marginali. Capitula pedunculata, racemoso-paniculata. Calyx $\frac{1}{2}$ lin., corolla 1 lin. longa. Legumen ignotum.

Hab. Tropical America: North Brazil.

With the foliage of *Acacia paniculata*, this has precisely the inflorescence and flowers of the two preceding species.

81. P. FRAGRANS, *Benth. in Hook. Lond. Journ.* iii. 220. Glabrum v. minute puberulum. Pinnæ 8–10-jugæ; foliola 30–40-juga, oblongo-linearia v. lineari-falcata, 2–4 lin. longa, nitidula, subtus pallida, costa excentrica v. submarginali. Capitula pedunculata, racemoso-paniculata. Calyx $\frac{1}{2}$–$\frac{3}{4}$ lin., corolla $1\frac{1}{2}$–2 lin. longa. Legumen rectum, planum, haud crassum, 3–4-pollicare, vix 6 lin. latum, indehiscens.

Inga fragrans, Macfad.! Fl. Jam. i. 309.

Acacia Balbisii, Spreng.! Syst. iii. 140.

A. Berteriana, DC.! Prod. ii. 470.

Pithecolobium Berterianum, Benth. in Hook. Lond. Journ. iii. 210.

Hab. Tropical America: Jamaica, San Domingo, *Bertero*, *Ehrenberg*; Veraguas, *Seemann*.

Sectio 5. ORTHOLOBIUM.

Frutices (rarius arbores?) spinis stipularibus armati. Pinnæ 1- v. plurijugæ. Foliola 1- v. plurijuga, parva v. rarius pollicaria. Pedunculi axillares v. ad apices ramorum breviter racemosi. Flores in capitulo globoso sessiles. Legumen ubi notum planum, rectum, in valvas membranaceas v. tenuiter coriaceas nec tortas nec elastice revolutas dehiscens. Seminum funiculus haud dilatatus.

The species of this section have the fruit approaching that of *Albizzia lophantha* and *A. montana*; but in other respects the section differs more widely than several others from that genus.

* *Spinæ stipulares rectæ. Flores parvi, glabri v. puberuli.*

82. P. ALBICANS, *Benth.* Cano-puberula v. pallens. Pinnæ 4–6-jugæ; foliola 12–20-juga, oblique oblongo-linearia, 3–4 lin. longa, puberula. Pedunculi axillares, summi breviter racemosi. Flores glabriusculi. Calyx $\frac{1}{2}$ lin., corolla 2 lin. longa. Legumen glabriusculum, stipitatum, 3–5-pollicare, ad 6 lin. latum, valvis tenuiter coriaceis.

Acacia albicans, Kunth! Mim. 87. t. 27.

Calliandra pallens, Benth.! in Hook. Lond. Journ. v. 102.

Hab. Tropical America: Mexico, Campeachy, *Humboldt and Bonpland*; Zimapan, *Coulter*, *Berlandier*, n. 3147.

83. P. BREVIFOLIUM, *Benth.! in A. Gray, Pl. Wright.* i. 67. Puberulum, glabrescens. Pinnæ 3–5-jugæ; foliola 10–20-juga, oblongo-linearia, 2–3 lin. longa, subtus pallida. Pedunculi ad apices ramorum racemosi, breves. Flores cano-puberuli. Calyx $\frac{1}{2}$ lin., corolla 2 lin. longa. Legumen breviter stipitatum, ad 3 poll. longum, 6 lin. latum, valvis submembranaceis.

Acacia Neuciana, Buckl. in Proc. Acad. Philad. 1861, 453 ex A. Gr.

Hab. Tropical and subtropical North America: Mexicano-Texan region, *Wislizenus*, *Berlandier*, *Emory's Expedition*, n. 331.

** *Spinæ reeurvæ v. crasso-conicæ. Flores angusti, longiusculi. Corolla sericeo-pilosa.*

84. P. PREHENSILE, *Benth.* Glabra, procumbens. Spinæ recurvæ. Folia minima. Pinnæ 1-jugæ; foliola 1-juga, obtusa, coriacea, vix linea longiora. Capitula sessilia, 2–3-flora. Calyx glabriusculus, 3–3½ lin., corolla sericeo-pilosa, 7–8 lin. longa. Staminum tubus longe exsertus. Legumen 1½–2½-pollicare, ad 6 lin. latum, valvis membranaceis, nervo marginatis.

Calliandra prehensilis, Wright ! in Sauv. Fl. Cub. 35.

Hab. Tropical America: Cuba, *Wright.*

With the aspect of *Calliandra colletioides* and *Pithecolobium hystrix*, this is at once known by the recurved stipular spines and the flowers. Wright and Sauvalle placed it in *Calliandra*, on account of the straight flat pod; but this pod has neither the contracted base nor the elastically revolute dehiscence characteristic of that genus.

85. P. SERICIFLORUM, *Benth. ! in Hook. Lond. Journ.* v. 105. Glabrum, corolla excepta. Spinæ recurvæ. Pinnæ 2-jugæ; foliola 2-juga, oblique obovata v. elliptica, ½–1-pollicaria. Capitula pedunculata, pauciflora. Calyx glaber, 4–4½ lin. longa. Corolla dense sericeo-pilosa, 7 lin. longa. Staminum tubus longe exsertus. Legumen semipedale, 1½ poll. latum, valvis membranaceis.

Acacia platyloba, Spreng. ! Syst. iii. 144; DC. ! Prod. ii. 472.

Hab. Tropical America: Santa Marta, *Bertero*; Venezuela, *Funcke*, n. 536.

Funcke's specimens are in flower only, and Bertero's in fruit only; but I have but little doubt that both belong to the same species, remarkable for its foliage, that of some species of *Unguis-cati*, its long flowers closely resembling those of the preceding and following species, and its large pod very much like that of some varieties of *Albizzia Lebbek*.

86. P. ACATLENSE, *Benth. in herb. plur.* Pubescens. Spinæ breves, conicæ v. recurvæ. Pinnæ 2–4-jugæ; foliola 8–12-juga, oblonga, acuta, ad 2 lin. longa, pubescentia. Capitula subsessilia, pauciflora. Calyx 4 lin. longus, laxe pubescens. Corolla albo-villosa, ad 7 lin. longa. Staminum tubus exsertus. Legumen ignotum.

Hab. Tropical America: Mexico, Acatlan, in the Pueblo district, *Andrieux*, n. 395.

Ramuli crassi, demum glabrati, nigricantes. Folia et flores breviter ad nodos vetustos conferti. Petiolus communis tenuis, subsemipollicaris, pubescens. Glandulæ parvæ. Pinnæ semipollicares v. paullo longiores. Foliola rigidula, sub pube venulosa. Flores in capitulo 4–8, sessiles. Calyx ut in binis præcedentibus siccus, tenuiter striatus, irregulariter dentatus. Corolla *P. sericiflori* angusta, dense villosa.

Sectio 6. CAULANTHON.

Inermes. Pinnæ 1- v. rarius 2- v. paucijugæ. Foliola 1- v. paucijuga, ampla (excepto *P. clavifloro*). Flores sæpius tenues, capitulis v. spicis ad nodos ramorum defoliatorum breviter pedunculatis fasciculatis.

* *Pinnæ 1-jugæ, petiolo communi brevissimo. Flores spicati.*

87. P. MACROPHYLLUM, *Spruce !*, sp. n. Glabrum. Foliola 2–5-juga, ovali-elliptica, ½–1-pedalia, addito sæpius minore ad basin rhacheos. Spicæ semipedales longioresque, interruptæ. Flores glabri. Calyx 1–1½ lin., corolla ad 6 lin. longa. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: Tarapoto in Eastern Peru, *Spruce.*

"Frutex volubilis robustus." Foliorum petiolus communis brevissimus, crassus. Pinnarum rhaches 6–10-pollicares. Glandulæ depressæ. Foliola breviter et acute acuminata, ima basi inæquilatera et in petiolulum 2–3-linearem crassum contracta, chartacea, læte virentia, pennivenia, venis primariis paucis subtus prominulis et reticulato-venosa. Spicæ cum floribus "undique rubræ." Flores solitarii v. gemini sessilesque, secus rhachin spicæ dissiti, inferiores a basi 1–1½ poll. distantes. Staminum tubus tenuis, corolla duplo longior; filamenta ultra 20, parte libera 8–9 lin. longa.

88. P. COCCINEUM, *Benth.* Glabrum. Foliola 3–5-juga, ovali-oblonga, acuminata, 4–6-pollicaria, addito minore ad basin rhacheos. Spicæ semipedales longioresque, interruptæ. Flores glabri. Calyx 1 lin., corolla fere 4 lin. longa. Staminum tubus inclusus v. vix exsertus. Legumen immaturum tomentellum, stipitatum, jam semipedale, 6 lin. latum.

Mimosa coccinea v. *M. punicea*, Pavon (*Herb. Boiss. et Oxon.*).

Inga coccinea, G. Don! Gen. Syst. ii. 390.

Hab. Tropical America: Muña in Peru, *Ruiz and Pavon.*

Foliorum petiolus communis subsemipollicaris, pinnarum rhaches semipedales. Glandulæ parvæ v. 0. Foliola subcoriacea, penninervia, venulosa. Spicæ *P. macrophylli*, sed flores multo minores staminum tubo abbreviato.

89. P. SELLOI, *Benth.! in Hook. Lond. Journ.* iii. 214. Glabrum. Foliola 1–3-juga, oblonga v. ovato-lanceolata, 2½–4-pollicaria, addito sæpius minore prope basin rhacheos. Spicæ 1–1½-pollicares, densæ, breviter pedunculatæ. Flores glabri. Calyx ½ lin., corolla 6 lin. longa. Legumen minute puberulum, breviter stipitatum, semipedale, 1 poll. latum. —*Fl. Bras. Mim.*

Hab. Tropical or subtropical South America: Brazil, probably southern, *Sello.*

90. P. SANGUINEUM, *Benth.! in Mart. Fl. Bras.* Glabrum. Foliola 2–3-juga, ovali-elliptica, coriacea, nitidula, majora 4-pollicaria, addito minore prope basin rhacheos. Spicæ 1–1½-pollicares, densæ, breviter pedunculatæ. Calyx 1½–2 lin., corolla fere 5 lin. longa. Legumen ignotum.

Inga sanguinea, Burch. MSS.

Hab. Tropical America: Brazil, prov. Sao Paulo.

91. P. VAHLIANUM, *Benth.* Glabrum. Foliola 1-juga, oblongo-lanceolata, acuminata, 3–5-pollicaria, addito sæpius tertio minore prope basin rhacheos. Spicæ densifloræ, rhache cum pedunculo brevissimo ½–1-pollicari. Flores tenues, glabri. Calyx 1 lin., corolla vix 3 lin. longa. Staminum tubus vix exsertus. Legumen 4–6-pollicare, ¾ poll. latum.

Mimosa ligustrina, Vahl! Ecl. iii. 34. t. 27, non Jacq.

Inga Vahliana, DC. Prod. ii. 438.

Pithecolobium ligustrinum, Benth.! in Hook. Lond. Journ. iii. 213.

Inga falciformis, DC.! Prod. ii. 438.

I. longifolia, Humb. et Bonpl.! in Willd. Spec. iv. 1010.

Mimosa longifolia, Poir. Dict. Suppl. i. 59.

Hab. Tropical America: Santa Marta, *v. Rohr.*, *Bertero*; in the Bracamoro district, *Humboldt and Bonpland.*

92. P. COGNATUM, *Benth.! in Hook. Lond. Journ.* v. 107. Glabrum, foliis et inflorescentia omnino *P. Vahliani*, sed calyx vix ½ lin. longa. Corolla tenuis, 3 lin. longa.

Staminum tubus longe exsertus. Legumen curvum v. undulatum, ½–1-pedale, ¾ poll. latum.

Inga cognata, Schlecht. in Linnæa, xii. 560.
Pithecolobium glomeratum, var. *spicatum*, Seem.! Bot. Her. 116.

Hab. Tropical America: Mexico, hot region, *Schiede and Deppe*; Costa Rica, *Œrsted*; Panama, *Seemann*, *Sutton Hayes*.

** *Pinnæ unijugæ, petiolo communi brevissimo. Flores capitati.*

93. P. UNIFOLIOLATUM, *Benth.! in Hook. Lond. Journ.* iii. 212. Glabrum. Foliola in quaque pinna solitaria (in folio 2), ovali-elliptica v. oblonga, majora 4–9-pollicaria. Capitula brevissime pedunculata. Calyx minutus. Corolla 3–4 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: North Brazil.

94. P. DIVARICATUM, *Benth.! in Hook. Lond. Journ.* iii. 213. Glabriusculum. Foliola 1-juga, oblongo-lanceolata, acuminata, 4–8-pollicaria, addito rarius tertio inferiore minore. Capitula pedunculata. Calyx lineam, corolla 2 lin. longa. Legumen sæpe pedale, arcuatum, 7–10 lin. latum, valvis coriaceis planis v. demum subtortis.—*Fl. Bras. Mim.*

Hab. Tropical America: North Brazil and Mattogrosso.

95. P. GLOMERATUM, *Benth.! in Hook. Lond. Journ.* iii. 213. Glabrum. Foliola 1–2-juga, ovata v. oblongo-lanceolata, acuminata, 3–4-pollicaria, paris inferioris dum adsit opposita, addito interdum inferiore minore. Capitula sessilia v. brevissime pedunculata. Calyx minutus; corolla ad 3 lin. longa. Legumen arcuatum v. circinatum, pollicem v. quod excedit latum.—*Fl. Bras. Mim.*; *Miq. Stirp. Surin.* t. 1.

Inga glomerata, DC. Prod. ii. 438.
I. cataractæ, H., B. et K.! Nov. Gen. et Sp. vi. 297.
Pithecolobium cataractæ, Benth. in Hook. Lond. Journ. iii. 213.
Inga ramiflora, G. Don! Gen. Syst. ii. 392.
Mimosa glomerata, Vell. Fl. Flum. Ic. xi. t. 43 (male).

Hab. Tropical America: North Brazil, Guiana, and Venezuela.

96. P. LATIFOLIUM, *Benth.! in Hook. Lond. Journ.* iii. 214. Glabrum. Foliola sæpius 2-juga, ovata v. ovato-oblonga, acuminata, majora 3–6-pollicaria, paris inferioris minora alterna, addito sæpe quinto inferiore minore. Capitula laxiflora, subsessilia v. breviter pedunculata. Calyx minutus. Corolla 3–3½ lin. longa. Legumen arcuatum, sæpe pedale, pollicem latum.—*Fl. Bras. Mim.*

Mimosa latifolia, Linn. Spec. 1499, ad Plum. Ic. t. 9.
Inga latifolia, Willd. Spec. iv. 1020.
Calliandra latifolia, Griseb.! Fl. Brit. W. Ind. 225.
Pithecolobium roseum, Spruce, Pl. Exs.
Zygia, P. Br. Jam. t. 22. f. 3.

Hab. Tropical America: North Brazil, Surinam, British Guiana, St. Vincent's, Jamaica, Panama.

97. P. CAULIFLORUM, *Mart.! Herb. Fl. Bras.* 116. Glabrum v. puberulum. Stipulæ deciduæ v. obsoletæ. Foliola 1–3-juga, ovali-oblonga, obtusa v. obtuse acuminata, majora

3–4-pollicaria, parium inferiorum opposita minora, addito sæpius minore inferiore. Capitula parva, breviter pedunculata. Calyx minutus; corolla 3–3½ lin. longa. Legumen arcuatum, 3–8-pollicare, ad 6 lin. latum.—*Fl. Bras. Mim.*

Inga cauliflora, Willd. Spec. iv. 1021.

Mimosa cauliflora, Poir. Dict. Suppl. i. 45.

Pithecolobium glabratum, Mart.! Herb. Fl. Bras. 116, forma glabrior.

Pithecolobium lasiopus, Benth.! in Hook. Journ. Bot. ii. 141; Lond. Journ. iii. 214, forma puberula.

Inga ramiflora, Steud. in Flora, 1843, 759.

Hab. Tropical America: Brazil, prov. Minas Geraes, North Brazil, Surinam, Cayenne, British Guiana.

98. P. STIPULARE, *Benth.! in Mart. Fl. Bras. Mim.* Puberulum. Stipulæ acutæ, induratæ, persistentes. Foliola 1–2-juga, ovata v. elliptica, 2–3-pollicaria, addito sæpius inferiore minore. Capitula sessilia v. brevissime pedunculata. Calyx minutus, corolla 3–3½ lin. longa. Legumen 4-pollicare, ad 7 lin. latum.—*Fl. Bras. Mim.*

P. cauliflorum, Benth.! in Hook. Lond. Journ. iii. 214, excl. synon.

Hab. Tropical America: North Brazil, Guiana.

99. P. INÆQUALE, *Benth.* Glabrum v. pilosulum. Foliola 2–3-juga, oblongo-elliptica v. subovato-lanceolata, majora 3–4-pollicaria, addito sæpius inferiore minore. Capitula pauciflora, breviter pedunculata. Calyx 1¼ lin. longus, corolla ad 3 lin. Legumen arcuatum v. circinatum, 8–9 lin. latum.—*Fl. Bras. Mim.*

Inga inæqualis, Humb. et Bonpl.! in Willd. Spec. ii. 1019.

Mimosa inæqualis, Poir. Dict. Suppl. i. 44.

Hab. Tropical America: North Brazil, Guiana, and Venezuela.

I had already, when seeing the single leaf preserved in the Paris herbarium, and described as simply pinnate, suspected that it was one only of the two pinnæ of a more compound leaf; and this view is now confirmed by the inspection of Willdenow's specimen, in which the very short common petiole remains attached, and shows the scar of the corresponding opposite pinna.

100. P. AMPLUM, *Spruce!, Benth. in Mart. Fl. Bras. Mim.* Puberulum, foliola 3–4-juga, ovali-oblonga, acuminata, majora 9–10-pollicaria, addito inferiore minore. Capitula brevissime pedunculata. Calyx 1 lin., corolla 3 lin. longa. Legumen ignotum.

Hab. Tropical America: North Brazil.

*** *Pinnæ petiolo evoluto* 2- *v. plurijugæ. Flores fasciculati v. breviter spicati.*

101. P. RAMIFLORUM, *Benth.! in Hook. Lond. Journ.* iii. 215. Glabrum v. tenuiter puberulum. Pinnæ 2-jugæ; foliola superiorum 5–7-juga, oblique oblongo-rhombea, coriacea, nitida, ultima 3-pollicaria, inferiora gradatim minora. Spicæ breves, subsessiles. Calyx linea brevior. Corolla fere 3 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Inga ramiflora, Bong. MSS.

Hab. Tropical America: North Brazil.

102. P. CLAVIFLORUM, *Spruce!, Benth. in Mart. Fl. Bras. Mim.* Ferrugineo-villosulum. Pinnæ 4–6-jugæ; foliola 10–45-juga, falcato-oblonga, membranacea, pallida, 6–9 lin. longa. Florum fasciculi sessiles. Calyx 1 lin., corolla 2–2½ lin. longa. Legumen ignotum.

Hab. Tropical America: North Brazil.

Sectio 7. Chloroleucon.

Spinæ hinc inde axillares, solitariæ v. geminæ. Pinnæ 2- v. plurijugæ. Foliola 5- v. multijuga, parvula. Capitula axillaria, pedunculata. Flores sessiles, tenues, glabri. Legumen planum, coriaceum v. subcarnosum, rectum v. curvum, vix dehiscens.

103. P. tortum, *Mart.! Herb. Fl. Bras.* 114. Glabrum v. pubescens. Pinnæ 2–5-jugæ; foliola 5–9-juga, oblique oblonga, 3–5 lin. longa. Calyx vix lineam longus, corolla $2\frac{1}{2}$-3 lin. longa. Legumen arcuatum v. fere circinatum, semipedale, 6-8 lin. latum.—*Benth. in Fl. Bras. Mim.*

Pithecolobium tortum et *P. Vincentis*, Benth.! in Hook. Lond. Journ. iii. 222.

Acacia Vincentis, Griseb.! Fl. Brit. W. Ind. 222.

Acacia lentiscifolia, A. Rich.! Fl. Cub. 469; Griseb.! Cat. Pl. Cub. 82, foliolis rigidioribus.

Var. undique pubescens.

Pithecolobium tenuiflorum, Benth.! in Hook. Lond. Journ. iii. 222.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Minas Geraes, Bahia, Para, etc. Guiana, Columbia, and West Indies, and a variety with rather fewer and longer leaflets in Bolivia, *D'Orbigny*.

104. P. dumosum, *Benth.! in Hook. Lond. Journ.* iii. 223. Ferrugineo-pubescens v. tomentosum. Pinnæ 3–4-jugæ; foliola 9–16-juga, oblique oblonga, 2–4 lin. longa. Calyx vix lineam longus. Corolla $2\frac{1}{2}$–3 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia.

Very closely allied to the pubescent variety of *P. tortum*.

105. P. Mathewsi, *Benth.! in Hook. Lond. Journ.* iii. 222. Pubescens. Pinnæ 5–8-jugæ; foliola 15–20-juga, oblique oblonga, 2–3 lin. longa. Calyx 1–$1\frac{1}{2}$ lin., corolla 3–$3\frac{1}{2}$ lin. longa. Legumen rectum v. arcuatum, semipedale v. longius, demum crassum, subcarnosum, 3–4 lin. latum.

Hab. Tropical America: Eastern Peru, Mozabamba, *Mathews*; Tarapoto, *Spruce* n. 4185.

106. P. Glazioui, *Benth.! in Mart. Fl. Bras. Mim.* Puberulum. Pinnæ 4–6-jugæ; foliola 20–30-juga, oblique linearia, 3–4 lin. longa. Calyx 1 lin., corolla 3–$3\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

The specimens seen are entirely without spines, but the inflorescence and flowers entirely those of the section, and the spines may very probably be formed in other specimens.

107. P. parvifolium, *Benth.! in Hook. Lond. Journ.* iii. 223. Puberulum. Pinnæ 5–10-jugæ; foliola 10–30-juga, linearia, $1\frac{1}{2}$–2 lin. longa. Calyx fere 1 lin., corolla vix 2 lineis longior. Legumen falcatum, crassum, durum, pluripollicare, 5–6 lin. latum.—*Fl. Bras. Mim.*

Mimosa mangensis, Jacq.! Stirp. Amer. 267.

Mimosa parvifolia, Sw.! Fl. Ind. Occid. ii. 984. non Poir.

Acacia parvifolia, Willd. Spec. iv. 1086.

Mimosa antillarum, Poir. Dict. Suppl. i. 80.

Acacia micrantha, Desv.! in Ham. Prod. Fl. Ind. Occid. 60, altered to *A. microcantha,* Desv. Journ. Bot. 1814, i. 69.

Inga Marthæ, Spreng.! in DC. Prod. ii. 441.

Calliandra Spruceana, Benth. Pl. Spruce, exs.

Hab. Tropical America: North Brazil, Guiana, Columbia, Central America, West Indies.

108. P. FOLIOLOSUM, *Benth.! in Hook. Lond. Journ.* iii. 223. Glabrum v. puberulum. Pinnæ 7–8-jugæ; foliola 20–50-juga, oblonga v. linearia, ad lineam longa, imbricata, obtusa. Calyx $\frac{3}{4}$ lin., corolla ad 2 lin. longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia and Pernambuco.

XXV. ENTEROLOBIUM, Mart.

Benth. et Hook. Gen. Pl. i. 598.

The genus only differs from *Pithecolobium* in the fruit, and might well be added to it as a section.

1. E. ELLIPTICUM, *Benth.! in Hook. Lond. Journ.* iii. 224. Subglabrum. Pinnæ 1–2-rarius 3-jugæ; foliola 4–6-juga, oblongo- v. ovali-elliptica, obtusa, coriacea, venosa, 1–1½-pollicaria, costa subcentrali. Legumen tomento tenuissimo canescens, 2½–3 poll. diametro.—*Fl. Bras. Mim.*

Pithecolobium gummiferum, Mart.! Herb. Fl. Bras. 116.

Hab. Tropical America: Brazil, prov. Sao Paulo, Minas Geraes, Goyaz, Bahia, and Pernambuco.

2. E. TIMBOUVA, *Mart.! Herb. Fl. Bras.* 128. Pubescens v. glabrum. Pinnæ 2–5-jugæ; foliola 10–20-juga, falcato-oblonga, 6–9 lin. longa, costa submarginali. Legumen opacum, vix 3 poll. diametro.—*Benth. in Fl. Bras. Mim.*

Mimosa contortisiliqua, Vell. Fl. Flum. Ic. xi. t. 25.

Enterolobium glaucescens, Mart.! Herb. Fl. Bras. 117.

Var. CANESCENS, foliolis fere pollicem longis.

E. Tamboril, Mart.! Herb. Fl. Bras. 117.

Hab. Tropical America: Brazil, prov. Bahia, Ceara, Minas Geraes, and southward on the Uruguay, *Tweedie.*

3. E. CYCLOCARPUM, *Griseb.! Fl. Brit. W. Ind.* 226. Subglabrum. Pinnæ 4–9-jugæ; foliola 20–30-juga, falcato-oblonga, 4–6 lin. longa, costa submarginali. Legumen glaberrimum, nitidum, 4 poll. diametro.

Mimosa cyclocarpa, Jacq. Fragm. 30, t. 34. f. 1.

Inga cyclocarpa, Willd. Spec. iv. 1026.

Pithecolobium cyclocarpum, Mart.! Herb. Fl. Bras. 115.

Hab. Tropical America: Venezuela, New Granada, Central America, West Indies.

Prosopis dubia, H., B. et K. Nov. Gen. et Sp. vi. 309, of which Kunth saw a single leaf only, is probably, from the description of the fruit taken from Bonpland's notes, the *E. cyclocarpum.*

4. E. MONJOLLO, *Mart. Herb. Fl. Bras.* 117. Pinnæ 6–7-jugæ; foliola multijuga, parva, ovata, imbricata. Legumen ad 2 poll. diametro.

Mimosa Monjollo, Vell. Fl. Flum. Ic. xi. t. 26.

Hab. Tropical America: Brazil, prov. Rio Janeiro? Known to me only through Vellozo's figure.

5. E. SCHOMBURGKII, *Benth. in Mart. Fl. Bras. Mim.* Ferrugineo-pubescens. Pinnæ 10–20-jugæ; foliola 50–60-juga, lineari-falcata, 1–2 lin. longa. Legumen opacum, ad 2 poll. diametro.

Pithecolobium Schomburgkii, Benth.! in Hook. Lond. Journ. iii. 219.

Hab. Tropical America: Brazil, prov. Rio Janeiro, North Brazil, Cayenne, Central America.

XXVI. SERIANTHES, Benth.

Benth. et Hook. Gen. Pl. i. 599.

1. S. GRANDIFLORA, *Benth.! in Hook. Lond. Journ.* iii. 225, *pro parte.* Pinnæ 4–8-jugæ; foliola 8–15-juga, falcato-oblonga, obtusa, basi sursum dilatata, ¾–1-pollicaria, tenuia, supra nitentia, subtus pallida, glabra, venis tenuibus. Spicæ interruptæ, 4–6-floræ. Flores breviter pedicellati, dense tomentoso-villosi. Calyx semipollicaris. Corolla pollicaris v. paullo longior. Legumen lignosum, semipedale, 2 poll. latum, crebre et obscure transverse venosum.

Inga grandiflora, Wall.! Cat. Herb. Ind. n. 5285.

Hab. Tropical Asia: Malacca, *Griffith, Maingay*; Philippine islands, *Cuming*, n. 1592.

2. S. VITIENSIS, *A. Gray! Bot. Amer. Expl. Exped.* i. 485. Pinnæ 6–8-jugæ; foliola 10–16-juga, oblique oblonga, obtusissima v. retusa, basi sursum dilatata, subsemipollicaria, supra nitida, subtus pallida, costa parum prominula. Flores ignoti. Legumen semipedale, 2 poll. latum, venis paucis valde elevatis a margine superiore subtransversis ramosis.

Hab. Feejee islands.

3. S. MYRIADENA, *Planch.! in Hook. Lond. Journ.* v. 108. Pinnæ 6–8-jugæ; foliola 10–20-juga, oblique oblonga, obtusa, 4–9 lin. longa, supra nigricantia, subtus pallida, puberula v. glabrata, costa prominula. Flores ad apicem pedunculi semipollicaris 2–4, sessiles. Calyx 3–4 lin., corolla 9–12 lin. longa. Legumen 4–6-pollicare, 2 poll. latum, rufo-velutinum, demum glabratum, crebre et obscure transverse venosum.—*A. Gray! Bot. Amer. Expl. Exped.* i. 485.

Acacia myriadena, Guillem.! Zeph. Tait. in Ann. Sc. Nat. Ser. 2, vii. 359.

Hab. Islands of the Pacific from New Caledonia to Otaheiti.

4. S. TENUIFLORA, *Benth.*, sp. n. Pinnæ 10–12-jugæ; foliola 15–20-juga, oblique v. subfalcato-oblonga, obtusa, subsemipollicaria, opaca, subtus pallida, utrinque appresse puberula. Flores ad apicem pedunculi ½–¾-pollicaris breviter pedicellati, subdissiti. Calyx 1½ lin., corolla 9–10 lin. longa, quam in cæteris speciebus tenuior. Legumen ignotum.

Hab. "Pacific islands, Cunningham" in Herb. Hooker. I do not know the history of this specimen. Allan Cunningham never visited the Pacific islands.

Folia *S. myriadenæ,* nisi pinnæ numerosiores. Inflorescentia et flores valde diversi. Pedunculi 4–6, ad apicem pedunculi communis 3–4-pollicaris corymbosi. Flores in quoque pedunculo subterni, pedicellis crassiusculis 1 lin. longis fulti, tomento brevi canescentes.

5. S. CALYCINA, *Benth.*, sp. n. Pinnæ 10–12-jugæ; foliola 10–20-juga, oblonga, obtusa, parum obliqua, subsemipollicaria, opaca, utrinque pubescentia, subtus canescentia, costa rufa valde prominente. Flores ad apicem pedunculi sessiles, dissiti. Calyx amplus, 8–9 lin. longus; corolla vix pollice longior. Legumen arcuatum, semipedale, pollicem latum, rufo-tomentosum.

Hab. New Caledonia, *Vieillard*, n. 419, *Deplanche*, n. 344.

Calyx amplus *S. grandifloræ*, et flores pariter interrupte etsi breviter spicati, sed sessiles v. subsessiles et corolla proportione multo brevior. Folia valde diversa, fere *S. vitiensis*, at foliola vix obliqua. Legumen quam in omnibus cæteris speciebus longius et multo angustius.

XXVII. ARCHIDENDRON, F. Muell.

Benth et Hook. Gen. Pl. i. 1004.

1. A. VAILLANTII, *F. Muell. ! Fragm.* v. 60. Glabrum. Pinnæ 1-jugæ; foliola 3–4-juga, oblique ovata, subsemipedalia, utrinque viridia, pennivenia et reticulato-venosissima, addito minore prope basin rhacheos. Flores in capitulo subsessiles. Calyx ad 4 lin. longus, crassus, tomentellus. Corolla pollice paullo longior, sericeo-tomentosa. Legumen 2–5-pollicare, 6–10 lin. latum, tortuosum, margine interiore incrassato, exteriore irregulariter crenato.

Pithecolobium v. *Albizzia Vaillantii*, F. Muell. Fragm. v. 9.

Hab. East tropical Australia, Rockingham Bay, *Dallachy*; and probably the same spespecies, a single leaf, Endeavour river, *A. Cunningham*.

2. A. LUCYI, *F. Muell. Fragm.* vi. 201. Glabrum. Pinnæ 2-jugæ; foliola 2–3-juga, oblique v. orbiculari-ovata, 3–6-pollicaria, utrinque nitidula, reticulato-venosissima. Flores pedicellati, glabri. Calyx 2 lin., corolla ad pollicem longa. Legumen lignescenti-coriaceum, margine exteriore profunde lobatum.

Pithecolobium Lucyi, F. Muell. *l. c.*

Hab. East tropical Australia: Rockingham Bay, *Dallachy*.

I have not seen this species, but take the above characters from F. Mueller's detailed description.

XXVIII. INGA, Willd.

Willd. Spec. iv. 1004, quoad species simpliciter pinnatas; Benth. et Hook. Gen. Pl. i. 599.

The following sections, although founded chiefly on the arrangement and indumentum of the flowers, are pretty fairly distinct, except perhaps the last two, which are as yet much confused, owing to the number of species in which the pod is unknown:—

Sect. 1. LEPTINGA. Flores glabri v. tomentelli, in receptaculo brevissimo distincte pedicellati, capitulum seu potius umbellam globosam formantes. Species 1–16.

Sect. 2. DIADEMA. Flores glabri, in receptaculo brevissimo sessiles v. brevissime pedicellati, capitulum globosum formantes. Species 17–31.

Sect. 3. BOURGONIA. Flores glabri, parvi, secus rhachin linearem spicati. Calyx minimus. Species 32–43.

Sect. 4. PSEUDINGA. Flores secus rhachin linearem spicati v. capitati. Corolla sericea v. rarius glabra, calyce evoluto. Leguminis margines nudi v. elevati, nec lateraliter dilatati. Species 44–118.

Series 1. *Glabrifloræ*. Corollæ glabræ, in sequentibus sericeæ v. villosæ. Species 44–47.

Series 2. *Gymnopodæ.* Petiolus sæpius nudus. Flores tenues, pollice breviores. Bracteæ caducissimæ. Species 48–65.

Series 3. *Pilosiusculæ.* Petiolus sæpius alatus. Flores tenues, pollice breviores. Bracteæ caducissimæ. Species 66–80.

Series 4. *Leptanthæ.* Petiolus alatus. Flores tenues, pollice breviores. Bracteæ persistentes. Species 81–86.

Series 5. *Longifloræ.* Petiolus alatus. Flores pollice longiores. Bracteæ caducissimæ v. minimæ. Species 87–93.

Series 6. *Calocephalæ.* Petiolus alatus v. nudus. Flores pollice longiores. Bracteæ persistentes. Foliola ampla. Species 94–104.

Series 7. *Vulpinæ.* Hirsutissimæ. Petiolus alatus v. nudus. Glandulæ stipitatæ. Bracteæ caducæ. Species 105–116.

Series 8. *Dysanthæ.* Flores fere *Euingæ*, pilis crispis hirsutissimi. Legumen *Vulpinarum*. Species 117, 118.

Sect 5. Euinga. Flores secus rhachin linearem spicati, sæpius latiores quam in *Pseudinga*. Corolla sericeo-villosa. Leguminis tomentosi margines valde dilatati, plurisulcati. Species 119–140.

Sectio 1. Leptinga. Flores sæpius parvi, glabri leviter tomentosi v. rarius tomentoso-villosi, in receptaculo minimo v. subgloboso umbellato-capitati, pedicellis calyce longioribus v. rarius calyce ampliore brevioribus.

* *Pedicelli calyce multo longiores. Petiolus late alatus. Flores tomentelli.*

1. I. myriantha, *Pœpp. et Endl.! Nov. Gen. et Sp.* iii. 77, t. 289. Tomentella. Petiolus late alatus; foliola 2-juga, elliptico-oblonga, acuminata, majora 5-pollicaria, glabra. Flores tomentelli. Pedicelli $\frac{1}{2}$–$\frac{3}{4}$-pollicares. Calyx $1\frac{1}{2}$ lin., corolla fere 5 lin. longa. Staminum tubus vix exsertus. Legumen ignotum.—*Benth.! in Fl. Bras. Mim.*

Hab. Tropical America: North Brazil, British Guiana, Eastern Peru, *Pœppig*, *Mathews*, n. 1593.

2. I. umbratica, *Pœpp. et Endl.! Nov. Gen. et Sp.* iii. 77. Tomentoso-puberula. Ramuli angulosi. Petiolus interrupte alatus; foliola 1–2-juga, ovali-oblonga v. elliptica, majora 8-pollicaria. Glandulæ maximæ. Umbellæ subsessiles v. brevissime pedunculatæ. Flores tomentelli. Pedicelli 3–4 lin. longi. Calyx linea paullo longior, corolla ad 3 lin. longa. Staminum tubus longe exsertus. Legumen "rectum, planum, glabrum."

Hab. Tropical America: Eastern Peru, *Pœppig*.

3. I. brevipes, *Benth.! in Hook. Journ. Bot.* ii. 144; *Lond. Journ.* iv. 580. Puberula. Petiolus late alatus; foliola 2-juga, ovata v. oblonga, acuminata, majora 4–5-pollicaria, molliter pubescentia. Umbellæ brevissime pedunculatæ. Flores tomentosi. Pedicelli 2–3 lin., calyx fere 2 lin., corolla fere 4 lin. longa. Staminum tubus vix exsertus. Legumen ignotum.

Hab. Tropical America: British Guiana, *Schomburgk*.

4. I. sciadion, *Steud.! in Flora*, 1843, 758. Subglabra. Petiolus alatus; foliola 2-juga, ovata v. oblonga, breviter acuminata, coriacea, nitida, majora semipedalia. Umbellæ

brevissime pedunculatæ. Flores tomentelli. Pedicelli 3–4 lin., calyx vix 1 lin., corolla ad 3 lin. longa. Staminum tubus breviter exsertus. Legumen ignotum.

Hab. Tropical America: Cayenne, *Sagot*, n. 959, Surinam, *Hostmann*, n. 170.

This may prove to be a variety only of *I. myriantha*.

** *Petiolus sæpius anguste alatus. Pedicelli calyce longiores. Flores glabri.*

5. I. PANURENSIS, *Spruce!, Benth. in Mart. Fl. Bras. Mim.* Glabra. Petiolus vix alatus; foliola uni- rarissime 2-juga, ovali-oblonga, acuminata, majora 4–5-pollicaria, nitida. Umbellæ pedunculatæ. Pedicelli ad 3 lin. longi. Calyx linea brevior. Corolla 3 lin. longa. Staminum tubus breviter exsertus. Legumen planum, glabrum, 6–9 lin. latum.

Hab. Tropical America: North Brazil.

6. I. UMBELLIFERA, *Steud. ex DC. Prod.* ii. 432. Glabra v. tomentella. Petiolus breviter et anguste alatus; foliola 2-juga, oblongo-lanceolata, majora 3–4-pollicaria, nitida. Umbellæ longe pedunculatæ. Pedicelli 6–9 lin., calyx vix 1 lin., corolla 4–5 lin. longa. Staminum tubus vix exsertus. Legumen glabrescens, sessile, planum, 9 lin. latum.—*Benth. in Fl. Bras. Mim.*

Mimosa umbellifera, Vahl! Ecl. iii. 30.

Inga rutilans, Spruce! Pl. Exs.

Hab. Tropical America: North Brazil, Cayenne, British Guiana.

7. I. LATERIFLORA, *Miq.! in Linnæa,* xix. 131. Glabra. Petiolus marginatus v. anguste alatus; foliola 2–3-juga, ovato-lanceolata v. oblonga, acuminata, nitida, majora 2–3-pollicaria. Umbellæ parvæ, secus ramos confertæ, breviter pedunculata. Pedicelli 1–1½ lin., calyx ¾ lin., corolla vix 2 lin. longa. Staminum tubus longe exsertus. Legumen breviter stipitatum, semipedale, ad 6 lin. latum, glabrum.—*Benth. in Fl. Bras. Mim.*

I. parviflora, Spruce, Pl. Exs.

Hab. Tropical America: North Brazil, Surinam.

8. I. VIRGULTOSA, *Desv. in Ann. Sc. Nat.* ix. 426. Glabra v. minute tomentella. Petiolus marginatus v. anguste alatus; foliola 3–6-juga, lanceolata, acuminata, nitida, majora 2–2½-pollicaria. Umbellæ breviter pedunculatæ. Pedicelli 3–4 lin., calyx ½ lin., corolla 2½–3 lin. longa. Staminum tubus breviter exsertus. Legumen glabrum, semipedale, ad 6 lin. latum.—*Benth. in Fl. Bras. Mim.*

Mimosa virgultosa, Vahl! Ecl. iii. 32.

Hab. Tropical America: North Brazil, Cayenne.

*** *Petiolus nudus v. subnudus. Pedicelli calyce longiores. Flores glabri* (*excepta* I. quaternata).

9. I. HETEROPHYLLA, *Willd. Spec.* iv. 1020. Glabra. Petiolus nudus v. brevissime marginatus; foliola 1–2- rarius 3–4-juga, ovato-oblonga v. sublanceolata, acuminata, nitida, majora 2–3-pollicaria. Umbellæ breviter pedunculatæ. Flores glabri. Pedicelli 2–3 lin., calyx ½–¾ lin., corolla 2½–3 lin. longa. Staminum tubus longiuscule exsertus. Legumen breviter stipitatum, 3–5-pollicare, 6–7 lin. latum.—*Benth. in Fl. Bras. Mim.*

Mimosa Paræ, Poir. Dict. Suppl. i. 44.
Inga umbellata, G. Don ! Gen. Syst. ii. 391.
I. protracta, Steud. ! in Flora, 1843, 758.
I. stenocarpa et *I. vouapæfolia*, Spruce ! Pl. Exs.

Hab. Tropical America : North Brazil, Guiana, West Indies, New Granada, Peru, and apparently also Coroico in Bolivia, *Pearce*.

10. I. SERTULIFERA, *DC. ! Prod.* ii. 436. Glabra v. ferrugineo-tomentella. Petiolus teres v. brevissime subalatus ; foliola sub-2-juga, ovata v. ovato-oblonga, breviter acuminata, coriacea, nitida, majora semipedalia. Umbellæ pedunculatæ. Flores glabri. Pedicelli 4–6 lin., calyx 1–1¼ lin., corolla 3½–4 lin. longa. Staminum tubus vix exsertus. Legumen sessile, 3–4-pollicare, 1 poll. latum.—*Benth. in Fl. Bras. Mim.*

Mimosa coriacea, Pers. Syn. ii. 262.
Inga coriacea, Desv. Journ. Bot. 1814. i. 71.

Hab. Tropical America : North Brazil, Surinam, Cayenne, British Guiana.

Var. LEPTOPUS, pedicellis duplo longioribus.
I. leptopus, Benth. ! in Hook. Lond. Journ. iv. 580.

Hab. Eastern Peru, *Pœppig*, *Mathews*, n. 1592.

11. I. FLAGELLIFORMIS, *Mart. ! Herb. Fl. Bras.* 112. Glabra. Stipulæ falcato-ovatæ. Petiolus nudus ; foliola 3–5-juga, oblongo-elliptica, coriacea, nitida, 4–6-pollicaria. Umbellæ longe pedunculatæ. Flores glabri. Pedicelli semipollicares. Calyx ad 2 lin., corolla 3–4 lin. longa. Staminum tubus vix exsertus. Legumen ignotum.—*Benth. in Fl. Bras. Mim.*

Mimosa flagelliformis, Vell. Fl. Flum. Ic. xi. t. 27.

Hab. Tropical America : Brazil, prov. Rio Janeiro, and Minas Geraes.

12. I. GRACILIFLORA, *Benth. ! in Hook. Lond. Journ.* iv. 582. Glabriuscula. Petiolus nudus ; foliola 3-juga, oblongo-elliptica, subsemipedalia. Umbellæ laterales, parvæ, brevissime pedunculatæ. Flores glabri. Pedicelli 2–3 lin., calyx vix ½ lin., corolla 3 lin. longa. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America : British Guiana.

13. I. QUATERNATA, *Pœpp. et Endl. ! Nov. Gen. et Sp.* iii. 79. Tomentoso-lanata v. glabrescens. Petiolus nudus ; foliola 3–4-juga, elliptico-oblonga, demum glabra v. ad venas puberula, 4–8-pollicaria. Umbellæ longiuscule pedunculatæ. Flores tomentosovillosi. Pedicelli 3–6 lin., calyx 2½ lin., corolla fere 5 lin. longa. Staminum tubus vix exsertus. Legumen ignotum.—*Benth. in Fl. Bras. Mim.*

Hab. Tropical America : North Brazil, New Granada, Ocaña, *Schlim.* n. 204.

**** *Petiolus nudus v. anguste alatus. Pedicelli breves. Flores glabri.*

14. I. LALLENSIS, *Spruce !*, sp. n. Minute puberula v. glabrescens. Petiolus nudus ; foliola 3–4-juga, obovali-oblonga v. elliptica, acuminata, majora semipedalia. Umbellæ longe pedunculatæ. Pedicelli 1–2 lin. longi. Calyx lineam, corolla 3–3½ lin. longa. Legumen ignotum.

Hab. Tropical America : woods about Lalla, Eastern Peru, *Spruce*.

Arbor 18-pedalis, ramosa, pluribus notis *I. flagelliformi* affinis, sed stipulis parvis, foliis non nitidis et pedicellis brevibus facile distincta. Glandulæ parvæ. Pedunculi 3–5-pollicares. Staminum tubus vix corollam excedens.

15. I. Selloana, *Benth.! in Hook. Lond. Journ.* iv. 583. Glabra. Petiolus nudus v. anguste alatus. Foliola 2–3-juga, ovali-oblonga v. oblongo-lanceolata, acuminata, nitida, majora 2–3½-pollicaria. Umbellæ longiuscule pedunculatæ. Pedicelli 1–1½ lin., calyx vix ½ lin., corolla 2½–3 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro and Sao Paulo.

Staminum tubus variare videtur corolla brevior v. longior.

16. I. cordistipula, *Mart.! Herb. Fl. Bras.* 111. Glabra. Stipulæ foliaceæ, latæ, subsemipollicares. Petiolus nudus v. anguste alatus; foliola 1–3-juga, oblonga v. sub-lanceolata, nitida, majora 2–4-pollicaria. Umbellæ longiuscule pedunculatæ. Pedicelli 1–3 lin., calyx amplus, 3–4 lin. longus. Corolla calyce paullo longior. Legumen sessile, 8–10-pollicare, pollicem latum.—*Benth. in Fl. Bras. Mim.*

Mimosa plana, Vell. Fl. Flum. Ic. xi. t. 10.

Hab. Tropical America: Brazil prov. Rio Janeiro.

The full calyx of this species can only be compared with those of *I. bullata* and *I. campanulata*.

(The pedicels in *I. heterophylla* are sometimes as short as in the species of the present group; and in the section *Diadema* the pedicels are sometimes very shortly developed in some of the glabrous species.)

Sectio 2. Diadema. Flores glabri v. parce puberuli, sæpius parvuli v. tenues, in receptaculo minimo v. subgloboso capitati, sessiles v. rarius breviter pedicellati. Foliorum petiolus nudus v. rarius angustissime marginatus. Glandulæ parvæ v. obsoletæ. Pedunculi sæpius longi, axillares.

* *Petiolus supra canaliculatus, inter juga marginatus v. angustissime alatus. Foliola sessilia. Species Brasilienses.*

17. I. lentiscifolia, *Benth.! in Hook. Lond. Journ.* iv. 592. Glabra. Petiolus marginatus; foliola 2–3-juga, oblongo-lanceolata, obtusa v. emarginata, coriacea, nitida, 1–1½-pollicaria. Pedunculi erecti. Calyx 1½ lin., corolla 3½ lin. longa. Staminum tubus inclusus. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical or subtropical South America: South Brazil, *Sello.*

18. I. diadema, *Mart. Herb. Fl. Bras.* 114. Petiolus nudus v. anguste alatus. Foliola 4–5-juga, elliptico-oblonga, utrinque angustata. Pedunculi longissimi, tenues, penduli.

Mimosa diadema, Vell. Fl. Flum. Ic. xi. t. 45.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

This is only known from Vellozo's rude figure, from which it would appear to be nearly allied to *I. nutans*, but with leaves at least twice as large and the peduncle 7 or 8 inches long. The head of flowers is figured as a mass of filaments without distinction of calyx, corolla, and stamens.

Some specimens from Tarapoto, *Spruce*, n. 4565, come very near to *I. diadema* as to foliage and peduncles, but they are in fruit only, and cannot be safely determined. The pod is shortly stipitate, 8 in. long and 1 in. wide.

19. I. NUTANS, *Mart.! Herb. Fl. Bras.* 114, Glabra. Petiolus anguste marginatus v. nudus; foliola 4–7-juga, ovali-oblonga, obtusa v. mucronulata, nitidula, majora 1–1½-pollicaria. Pedunculi longi, tenues, penduli. Flores in capitulo pauci, brevissime pedicellati. Calyx vix ½ lin., corolla 3 lin. longa. Staminum tubus exsertus. Legumen longe stipitatum, semipedale v. longius, ¾ poll. latum.—*Benth. in Fl. Bras. Mim.*

Mimosa nutans, Vell. Fl. Flum. Ic. ix. t. 44, floribus pessime delineatis.

Mimosa tenuis, Vell. *l. c.* t. 11, fructifer.

Inga tenuis, Mart.! Herb. Fl. Bras. 114.

20. I. SCHINIFOLIA, *Benth. in Hook. Lond. Journ.* iv. 584. Glabra. Petiolus angustissime marginatus v. nudus; foliola 8–12-juga, oblongo-rhombea, subfalcata, pleraque vix semipollicem excedentia, nitida. Pedunculi tenues, penduli. Flores in capitulo sessiles, ultra 20. Calyx ½ lin., corolla 4 lin. longa. Staminum tubus inclusus. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

** *Petiolus teres, nudus. Foliola arcte sessilia. Species Centro-Americanæ v. Columbianæ.*

21. I. TUBULIFERA, *Benth.! in Hook. Lond. Journ.* iv. 584. Ferrugineo-pubescens. Foliola 6–8-juga, oblique oblonga v. lanceolato-ovata, majora 2–2½-pollicaria. Capitula densa, longe pedunculata. Calyx pubescens, ½ lin. longus. Corolla glabra, 4 lin. longa, tenuis. Legumen ignotum.

Hab. Tropical America: West coast of Columbia, *Barclay*; Panama, *Cuming*, n. 1282, Veraguas, *Seemann*.

22. I. RUFESCENS, *Benth.! in Hook. Lond. Journ.* iv. 585. Ferrugineo-villosa. Foliola 4–5-juga, obovali-oblonga, basi oblique subcordata, majora 2–3-pollicaria, membranacea. Capitula densa, longe pedunculata. Flores in speciminibus nondum perfecte evoluti. Legumen ignotum.

Hab. Tropical America: West coast of Columbia, Veraguas, *Hinds*.

This is evidently near *I. tubulifera*, but more villous, the leaflets fewer and larger, the veins more conspicuous on the upper surface, the peduncles more slender, the bracts more prominent. The species may, however, require confirmation from specimens with the flowers further advanced.

23. I. GLOBULIFERA, *Benth.! in Hook. Lond. Journ.* iv. 585. Ferrugineo-tomentella. Foliola sub-4-juga, obovali- v. oblongo-elliptica, basi breviter cuneata, 2–4-pollicaria, membranacea. Capitula densa, longe pedunculata. Calyx puberulus, vix 1½ lin. longus. Corolla glabra, 3½ lin. longa. Legumen ignotum.

Hab. Tropical America: Western Columbia, Veraguas, *Barclay*; Panama, *Sutton Hayes*, *Seemann*.

24. I. BILLBERGIANA, *Benth.! in Hook. Lond. Journ.* iv. 585. Ferrugineo-pubescens; foliola 2-juga, ovali-elliptica, basi breviter cuneata, 3–4-pollicaria. Capitula densa, longe pedunculata. Flores subglobosi, iis *I. globuliferæ* similes, sed in speciminibus suppetentibus nondum bene evoluti. Legumen ignotum.

Hab. Tropical America: Porto Bello, *Billberg* (*Hvrb. Berol.*)

**** Petiolus teres, nudus. Foliola petiolulata.*

† Species Columbiano-Mexicanæ.

25. I. MEMBRANACEA, *Benth.*, sp. n. Subglabra. Foliola 2–3-juga, brevissime petiolulata, ovali-elliptica, obtusa v. obtuse acuminata, 2–3-pollicaria, membranacea, nitidula, venulosa. Pedunculi tenues. Flores sessiles, glabri. Calyx $1\frac{1}{2}$ lin., corolla 3 lin. longa. Legumen ignotum.

Hab. Tropical America: Western Columbia, Veraguas, *Seemann*.

Partes novellæ minutissime puberulæ, specimina cæterum glabra. Rami tenues. Stipulæ obsoletæ. Foliorum petiolus tenuis, $1\frac{1}{2}$–3-pollicaris. Glandulæ minimæ v. obscuræ. Pedunculi axillares v. ad nodos defoliatos laterales, 1–$1\frac{1}{2}$-pollicares. Receptaculum minimum, globosum. Staminum tubus inclusus.

26. I. JINICUIL, *Schlecht.! in Linnæa*, xii. 559. Glabra. Foliola 3-juga, longiuscule petiolulata, ovali- v. elliptico-oblonga, basi breviter cuneata, acutiuscula, nitidula, majora 4–6-pollicaria. Capitula densa, longe pedunculata. Flores glabri, sessiles v. brevissime pedicellati. Calyx 1 lin., corolla 3 lin. longa. Legumen glabrum, 6–10-spermum.

Hab. Tropical America: Mexico, *Schiede*, *Jurgensen* n. 594, *Sumichrast* n. 1037; Guatemala, *Fraser*.

27. I. DARIENENSIS, *Seem.! Bot. Her.* 117, t. 23. Ferrugineo-pubescens. Foliola 2–4-juga, longiuscule petiolulata, ovali-elliptica, acuminata, basi cuneata, nitidula, subtus venosa, majora 4-pollicaria. Capitula densa, pedunculata. Calyx 1 lin. longus, pubescens. Corolla glabra, ad 3 lin. longa. Legumen ignotum.

Hab. Tropical America: Darien, dark woods at Cape Corrientes, *Seemann*.

Very near to *I. Jinicuil*.

†† Species Brasilianæ.

28. I. LANCEÆFOLIA, *Benth.! in Mart. Fl. Bras. Mim.* Glabra. Foliola 2–3-juga, oblongo-lanceolata, acuminata, in petiolulum angustata. Pedunculi rigidi. Flores glabri v. vix puberuli, subsessiles. Calyx ad 1 lin., corolla 3 lin. longa. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

29. I. CINNAMOMEA, *Spruce!*, *Benth. in Mart. Fl. Bras. Mim.* Glabra. Foliola 3-juga, longiuscule petiolulata, oblongo-elliptica, majora 8-pollicaria. Capitula longe pedunculata. Flores sessiles, glabri. Calyx $2\frac{1}{2}$ lin. longus, corolla vix longior. Stamina vix semipollicaria. Legumen "*Ingæ*."

Hab. Tropical America: North Brazil.

30. I. BULLATA, *Benth.! in Hook. Lond. Journ.* iv. 607. Rufo-hirsuta. Foliola 2–3-juga, breviter petiolulata, ovata v. oblongo-elliptica, obtusa, 5–9-pollicaria, subbullata. Pedunculi breves, pauciflori. Calyx campanulatus, fere 5 lin. longus, glaber. Corolla semipollicaris, apice setosa. Stamina sesquipollicaria. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

31. I. CAMPANULATA, *Benth.! in Mart. Fl. Bras. Mim.* Rufo-villosula. Foliola 2–3-juga, brevissime petiolulata, ovali-elliptica, abrupte acuminata, majora 4-pollicaria, membranacea. Capitula multiflora, longiuscule pedunculata. Calyx campanulatus, 5 lin. longus. Corolla semipollicaris, parce pilosa. Stamina sesquipollicaria. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

Possibly a variety of *I. bullata*; but, besides the differences in foliage and inflorescence, the flowers are said to be white in *I. bullata*, yellow in *I. campanulata*.

Sectio 3. BURGONIA.

Flores parvi, glabri v. parce puberuli, in spicas elongatas cylindraceas v. breves ovoideas v. oblongas dispositi, in rhache lineari sessiles v. brevissime pedicellati. Corolla tenuis, infundibularis, calycem sæpius minimum triplo saltem superans. Foliorum petiolus nudus v. breviter angusteque rarius undique v. late alatus. Glandulæ sessiles v. parum elevatæ.

None of the characters by which the first four or five species are distinguished from each other is constant; they are, however, generally well marked in the greater number of the very numerous specimens I have seen, the species having generally a wide geographical range.

* *Spicæ elongatæ, axillares, sæpius laxifloræ.*

32. I. LAURINA, *Willd. Spec.* iv. 1018. Glabra. Petiolus nudus v. vix angustissime marginatus; foliola 2-juga, ovata v. ovali-oblonga, obtusa v. obtuse acuminata, coriacea, nitida, majora 2–3-pollicaria. Spicæ axillares, elongatæ. Calyx vix lineam, corolla 3 lin. longa. Staminum tubus inclusus. Legumen basi valde obliquum, 3–4-pollicare, fere pollicem latum.—*Griseb. Fl. Brit. W. Ind.* 227.

Mimosa laurina, Swartz! Fl. Ind. Occid. ii. 978; Sieb.! Fl. Trin. n. 110.

Mimosa fagifolia, Jacq. Stirp. Amer. 264, t. 164, non Linn.

Mimosa coruscans, Sieb.! Fl. Martin. n. 324.

Hab. Tropical America: West Indies, Trinidad, Santa Lucia, Dominica, Martinica, Guadalupa, St. Thomas. Specimens also from Veraguas, *Seemann*, seem rather to belong to this than to *I. fagifolia*.

I. laurina is evidently the plant figured by Jacquin, and imperfectly described from his drawing, no specimen having been preserved.

33. I. FAGIFOLIA, *Willd. Herb. fide Klotzsch.* Glabra v. vix puberula. Petiolus marginatus anguste alatus v. subnudus; foliola 2-juga, ovata v. ovato-oblonga, obtusa v. obtuse acuminata, coriacea, nitida, majora 3, rarius 4 poll. longa. Spicæ axillares, elongatæ. Calyx vix lineam longus v. brevior, corolla ad 3 lin. Staminum tubus longiuscule exsertus. Legumen 3–5-pollicare, ad $\frac{3}{4}$ poll. latum.—*Benth. in Fl. Bras. Mim.*

Mimosa fagifolia, Linn. Spec. 1498, ad ic. Plum. t. 141. f. 2.

Inga marginata, Willd. Spec. iv. 1015, quoad syn. nec descr.; Benth. in Hook. Lond. Journ. iv. 588, excl. syn.

Mimosa tetraphylla, Vell. Fl. Flum. Ic. xi. t. 8.

Inga tetraphylla, Mart. Herb. Fl. Bras. 112 pro parte.

Hab. Tropical America: spread over the greater part of tropical Brazil, Guiana, and Venezuela.

This differs generally from *I. laurina* in its more decidedly bordered petiole, exserted staminal tube and narrower pod, and from *I. marginata* in its more coriaceous, less acuminate leaflets; but intermediate specimens occur on both sides.

Mimosa didyma, Vell. Fl. Flum. Ic. xi. t. 46, may be a rude representation of some form of this; but the drawing is evidently so inaccurate as to be quite unrecognizable.

34. I. MARGINATA, *Willd.! Spec.* iv. 1015, *excl. syn.* Glabra v. puberula. Petiolus sub foliolis terminalibus breviter v. anguste alatus rarius subnudus; foliola 2- rarius 3-juga, oblonga v. oblongo-lanceolata, acuminata, 3–4-pollicaria v. maxima duplo majora, submembranacea. Spicæ axillares, elongatæ. Staminum tubus sæpius exsertus. Calyx ad $\frac{1}{2}$ lin., corolla 2 lin. longa. Legumen vulgo 2–3-pollicare, semipollicem latum.—*Benth. in Fl. Bras. Mim.*

Mimosa semialata, Vell. Fl. Flum. Ic. xi. t. 5.
Inga semialata, Mart.! Herb. Fl. Bras. 111.
I. guayaquilensis, G. Don! Gen. Syst. ii. 391.
I. odorata, G. Don, *l. c.* 388? ex char. nimis brevi.
I. excelsa, Pœpp. et Endl. Nov. Gen. et Sp. iii. 78.
I. puberula, Benth.! in Hook. Lond. Journ. iv. 589.
I. pycnostachya, Benth.! *l. c.* spicis longis dense floribundis.
I. leptostachya, Benth.! in Pl. Spruce Exs. spicis longis laxifloris.
I. sapida, H., B. et K. Nov. Gen. et Sp. vi. 286? ex specimine manco.

Hab. Tropical America: common in tropical Brazil, extending into Bolivia, Peru, Ecuador, and Columbia, to Panama.

Exceedingly variable, especially as to the wings of the petiole, which are usually short, cuneate, or obcordate, but are sometimes narrow, and extend almost or quite to the lower pair of leaflets, or even, in some leaves, disappear altogether. *I. verrucosa*, Presl, Bot. Bem. 66, may belong either to this or to the preceding species.

35. I. CYLINDRICA, *Mart.! Herb. Fl. Bras.* 114. Glabra v. puberula. Petiolus nudus v. rarius hinc inde marginatus, foliola 3–4-juga, oblonga, obtusa v. acuminata, tenuiter coriacea, majora 4–5-pollicaria. Spicæ axillares, elongatæ. Calyx ad $\frac{1}{2}$ lin., corolla 2 lin. longa. Staminum tubus exsertus. Legumen ad 8 poll. longum, 9–10 lin. latum.—*Benth. in Fl. Bras. Mim.*

Mimosa cylindrica, Vell. Fl. Flum. Ic. xi. t. 9.
Inga polystachya, Benth.! in Hook. Lond. Journ. iv. 587.

Hab. Tropical America: Brazil, prov. Minas Geraes, Bahia, and Goyaz, and perhaps also North Brazil, but sometimes difficult to distinguish positively from *I. coruscans*, of which it may prove to be a variety.

36. I. CORUSCANS, *Humb. et Bonpl. in Willd. Spec.* iv. 1017. Glabra. Petiolus nudus; foliola 3-juga, ovali-elliptica v. oblonga, coriacea, nitida, 2–4-pollicaria. Spicæ axillares, elongatæ. Calyx semilinea brevior, corolla $2\frac{1}{2}$–3 lin. longa. Staminum tubus vix v. breviter exsertus. Legumen ignotum.

Mimosa coruscans, Poir. Dict. Suppl. i. 43.

Hab. Tropical America: British Guiana, Columbia.

37. I. TOMENTOSA, *Benth.*, sp. n. Tomentosa. Petiolus inter juga alatus; foliola 3-juga, oblonga, obtuse acuminata, 3–4-pollicaria. Spicæ axillares, elongatæ. Flores minute tomentosi. Calyx linea paullo brevior. Corolla 2 lin. longa. Staminum tubus inclusus. Legumen ignotum.

Hab. Tropical America: near El Garania in Peru, *Lechler*, n. 2323.

Tota pilis brevissimis crispulis tomentosa, tomento demum a pagina superiore foliolorum detergibili. Ramuli angulati. Stipulas non vidi. Foliorum petiolus 6–8-pollicaris, inter juga alatus, infra jugum infimum subnudus. Foliola brevissime petiolulata, basi rotundata. Spicæ in speciminibus visis semipedales, interruptæ, breviter pedunculatæ. Flores sessiles. Bracteæ parvæ, caducæ. Stamina numerosa.

With the inflorescence and small flowers of *I. marginata* and *I. cylindrica*, this species is well marked by the tomentum, exceptional in the section.

** *Spicæ breves, ad nodos defoliatos v. rarius in axillis fasciculatæ.*

38. I. AGGREGATA, *G. Don, Gen. Syst.* ii. 391. Glabra. Petiolus anguste alatus v. subnudus; foliola 2–4-juga, ovali- v. elliptico-oblonga, acuminata, membranacea, majora 5-pollicaria. Spicæ in axillis v. ad nodos defoliatos plures, sessiles v. breviter pedunculatæ, rhache vix semipollicari. Flores subglabri. Calyx 1 lin., corolla ad 3 lin. longa. Legumen rectum v. arcuatum, 6–7 lin. latum.

Inga sapida, Benth.! in Hook. Lond. Journ. 590, non H., B. et K.

Hab. Tropical America: Peru, *Pavon*; near Yurimaguas, *Pœppig* n. 2208, and, apparently the same, British Guiana, *Schomburgk*.

I have little doubt that Pavon's specimen of this plant in the Fielding herbarium, now forming part of the Oxford herbarium, is the one described by Don as *I. aggregata*, although the Pavonian label attached to the label-sheet bears the name of *I. Ruiziana* in Don's handwriting; but it is evident that, by some mistake, the label has been exchanged with that of one of the three specimens in the same collection agreeing with the characters of the true *I. Ruiziana*. Pavon's specimen and Schomburgk's specimens have lost their bracts, which are small and persistent in Pœppig's fruiting specimens; but I believe that all belong to one species.

39. I. BOURGONI, *DC. Prod.* ii. 434. Glabra v. puberula. Petiolus sub foliolis breviter alatus; foliola 2–3- rarissime 4-juga, ovato-oblonga, acuminata, nitida, majora 4–5-pollicaria. Spicæ densæ, oblongæ, laterales, aggregatæ. Calyx vix $\frac{3}{4}$ lin., corolla 3 lin. longa. Staminum tubus exsertus. Legumen rectum, planum, glabrum, haud crassum, marginibus parum elevatis, 3–5 poll. longum, ad $\frac{3}{4}$ poll. latum.

Mimosa Bourgoni, Aubl.! Pl. Gui. ii. 941, t. 358.

Mimosa alba, Vahl! Ecl. Amer. iii. 31, non Swartz.

Inga assimilis, Miq.! in Linnæa xix. 130.

Hab. Tropical America: Surinam, Cayenne, and British Guiana.

40. I. PEZIZIFERA, *Benth.! in Hook. Lond. Journ.* iv. 587. Tomentella, foliis glabris. Petiolus nudus; glandulæ maximæ; foliola 4-juga, ovato-oblonga, acuminata, coriacea, nitida, 3–4-pollicaria. Spicæ densæ, oblongæ, laterales, aggregatæ. Flores glabri. Calyx $\frac{1}{2}$ lin., corolla fere 3 lin. longa. Staminum tubus exsertus. Legumen ignotum.

Hab. Tropical America: British Guiana, *Schomburgk*.

41. I. TARAPOTENSIS, *Spruce!* sp. n. Glabra. Petiolus subnudus; foliola 2–3-juga, oblongo-elliptica, obtusa v. obtuse acuminata, coriacea, nitidula, 2–3-pollicaria. Spicæ

densæ, subglobosæ, laterales, aggregatæ v. breviter racemosæ. Calyx vix $\frac{1}{2}$ lin., corolla $2\frac{1}{2}$ lin. longa. Staminum tubus breviter exsertus. Legumen ignotum.

Hab. Tropical America: Eastern Peru, near Tarapoto, *Spruce* n. 4221.

Arbor 18-pedalis, coma patula. Foliorum petiolus 1–2-pollicaris, nunc omnino nudus, nunc sub foliolis brevissime marginatus. Foliola basi in petiolum brevissimum contracta. Glandulæ parvæ, scutellatæ. Pedunculi tenues, $\frac{1}{2}$–1-pollicares. Spicarum rhachis vix 2 lineis longior. Flores numerosi, albi, pedicello $\frac{1}{2}$ lin. longo fulti, odore *Narthecii ossifragi* scatentes, tenuissimi.

42. I. TENUIFOLIA, *Benth. ! in Hook. Lond. Journ.* iv. 587. Glabra. Petiolus nudus. Foliola 4-juga, lanceolata, acuta, $\frac{1}{2}$–2-pollicaria. Spicæ densæ, oblongo-cylindraceæ, laterales, pedunculatæ, sæpius fasciculatæ. Calyx vix $\frac{1}{2}$ linea longior, corolla fere 2 lin. longa. Staminum tubus vix exsertus. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Minas Geraes.

43. I. ALBA, *Willd. Spec.* iv. 1013. Glabra v. vix puberula. Petiolus subnudus; foliola 3–5-juga, ovata v. oblonga, submembranacea, majora 3–4-pollicaria. Spicæ ovoideo-globosæ v. breviter oblongæ, densæ, laterales, aggregatæ v. breviter paniculatæ. Calyx $\frac{1}{2}$ lin., corolla $1\frac{1}{2}$ lin. longa. Staminum tubus exsertus. Legumen sessile, semipedale, $\frac{3}{4}$ poll. latum.— *Benth. in Fl. Bras. Mim.*

Mimosa alba, Swartz ! Fl. Ind. Occid. ii. 976, non Vahl.
Inga fraxinea, Willd. ! Spec. iv. 1019.
Mimosa fraxinea, Poir. Dict. Suppl. i. 44.
Inga thyrsoidea, Desv. ! Journ. Bot. 1814, i. 71.
Inga Spruceana, Benth. ! in Pl. Spruce Exs.
Inga parviflora, Sagot ! Pl. Exs.

Hab. Tropical America: North Brazil, Cayenne.

(See also 45, *I. microcalyx,* which has the short calyx of *Burgonia*.)

Sectio 4. PSEUDINGA.

Flores in spicas primum breves demum parum elongandas rarius oblongo-cylindraceas v. interrupte paucifloras dispositi, in rhache lineari sessiles v. rarius pedicellati. Calyx anguste tubulosus, rarius in speciebus parvifloris subcampanulatus, pilosus v. rarius glaber. Corolla (excepta seriei prioris) sericeo-villosa. Legumen ubi notum planum, crassum v. tenue, marginibus nudis v. elevatis nec lateraliter dilatatis, quam facies planæ sæpissime angustioribus, glabrum v. hirsutum. Petioli nudi v. alati. Glandulæ sæpissime adsunt. Spicæ sæpissime axillares v. ad apices ramorum corymbosæ.

Although readily distinguished from the foregoing sections, it is very difficult to trace any definite line to separate this section from *Euinga*, especially whilst the ripe fruit of so many species remains unknown or uncertain. The arrangement, therefore, here given may have to be considerably modified as the several species become better known.

Series 1. Glabrifloræ. *Petiolus nudus. Calyx glaber v. tenuiter puberulus. Corolla glabra.*

This series approaches the section *Burgonia*, from which it is distingnished chiefly in habit and in the more developed calyx.

44. I. STIPULARIS, *DC. ! Mém. Lég.* 440; *Prod.* ii. 435. Glabra. Stipulæ latæ, rigide foliaceæ, subpersistentes. Foliola 2–3-juga, ovata, coriacea, nitida, majora 4–6-polli-

caria. Spicæ ovoideo globosæ, pedunculatæ, axillares v. subpaniculatæ. Calyx 2 lin., corolla 4–4½ lin. longa. Staminum tubus inclusus. Legumen 6–8-pollicare, 7–8 lin. latum.—*Benth. in Fl. Bras. Mim*

Hab. Tropical America: North Brazil, Cayenne, Surinam.

45. I. MICROCALYX, *Spruce!, Benth.! in Mart. Fl. Bras. Mim.* Glabra. Stipulæ angustæ, caducæ. Foliola 2–3-juga, ovata v. elliptica, subcoriacea, nitida, majora 3–5-pollicaria v. rarius 6–8-pollicaria. Spicæ oblongæ, axillares, longe pedunculatæ. Calyx linea brevior, corolla 3–3½ lin. longa. Stamina ultrapollicaria, tubo exserto. Legumen ignotum.

Hab. Tropical America: North Brazil.

This has the small calyx and corolla of the short-spiked species of *Burgonia*; but the long stamens and inflorescence are those of *Pseudinga*.

46. I. CAPITATA, *Desv.! Journ. Bot.* 1814. i. 71. Glabra. Foliola 2-juga, ovato-oblonga, coriacea, nitida, majora 3–6-pollicaria. Spicæ ovoideæ, densæ, axillares, longe pedunculatæ. Calyx 3–4 lin., corolla ad 6 lin. longa. Stamina sesquipollicaria, tubo incluso. Legumen ignotum.—*Benth. in Fl. Bras. Mim.*

I. albicans, Walp.! in Linnæa, xiv. 298.

I. pedunculatis, Mart.! Herb. Fl. Bras. n. 1095.

I. calycina, Salzm.! Pl. Exs.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

The Surinam specimens distributed by Miquel under the name of *I. capitata* belong to *Pithecolobium lætum*. Some single specimens among the Brazilian ones of *I. capitata* vary slightly from the above characters, but are insufficient to determine whether they are to be regarded as marked varieties or distinct species.

47. I. STENOCALYX, *Spruce!*, sp. n. Glabra. Foliola 3–4-juga, petiolulata, oblonga, acuminata, coriacea, nitida, majora 2–2½-pollicaria. Spicæ elongatæ, axillares, pedunculatæ. Calyx in alabastro jam 2 lin. longus, angustus. Flores perfecte evoluti et legumen ignota.

Hab. Tropical America: summit of Mount Guayrapurina in Ecuador, *Spruce* n. 4882.

Arbor 20-pedalis, ramosissima, ex omni parte glaberrima, *I. capitatæ* evidenter affinis, sed spicis elongatis et foliolis angustis 3–4-jugis distincta. Stipulæ lineari-falcatæ, rigidæ, caducæ v. minimæ. Foliorum petiolus 1–2½-pollicaris, teres v. supra vix canaliculatus. Foliola pleraque longe et obtuse acuminata, basi cuneata, petiolulo 1–1½ lin. longo, ¾–1 poll. lata, pennivenia. Spicæ in speciminibus nondum perfecte evolutæ jam ultrapollicares, pedunculo longiusculo fultæ, in axillis superioribus paniculatæ, laxifloræ. Flores glaberrimi, nitidi, sessiles. Corolla, adhuc in calyce clauso inclusa, stamina fovet numerosa basi monadelpha.

(See also 103, *I. sapindoides,* which is said to have glabrous flowers, but has winged petioles and the habit of several *Calocephalæ*).

Series 2. Gymnopodæ. *Petiolus foliorum omnium v. plerumque nudus v. sub foliolis superioribus leviter marginatus. Glandulæ sessiles, rarissime desunt. Bracteæ parvæ, caducæ. Calyx tubulosus, pilosulus v. laxe pubescens, rarius glaber. Corolla dense*

sericeo-pubescens v. villosa, rarius parce strigosa. Legumen planum, ante maturitatem haud crassum, glabrum v. vix puberulum.

* *Foliola bijuga. Flores strigosi.*

48. I. MARTINICENSIS, *Presl! Symb.* i. 65, t. 42. Ferrugineo-pubescens. Foliola 2-juga, obovata, pilosula, 4–5-pollicaria. Spicæ breviter pedunculatæ, densissime oblongo-cylindraceæ, $1\frac{1}{2}$-pollicares. Flores sessiles, strigosi. Calyx $1\frac{1}{2}$ lin. longus; corolla 3 lin. longa, usque ad calycem 5-fida. Staminum tubus inclusus. Legumen ignotum. —*Griseb. Fl. Brit. W. Ind.* 227, *pro parte.*

Mimosa coriacea, Sieb. ! Fl. Martin. n. 325.

Hab. Tropical America: West Indies, Martinica, *Sieber.*

49. I. DOMINICENSIS, *Benth.*, sp. n. Glabra v. pilis raris conspersa. Foliola 2-juga, ovato-lanceolata v. oblongo-elliptica, obtusa, nitida, 3–4-pollicaria. Spicæ breviter pedunculatæ, dense oblongo-cylindraceæ, $1\frac{1}{2}$-pollicares. Flores pedicellati, parce strigillosi. Calyx linea paullo longior. Corolla infundibularis, fere 3 lin. longa, tubo calycem excedente. Staminum tubus inclusus. Legumen ignotum.

I. martinicensis, Griseb. ! Fl. Brit. W. Ind. 227, pro parte.

Hab. Tropical America: West Indies, Dominica, *Imray.*

Certainly allied to *I. martinicensis*; but the two species, placed side by side, have a very different aspect.

** *Foliola pleraque v. omnia bijuga. Corolla sericeo-villosa.*

50. I. LEIOCALYCINA, *Benth.! in Hook. Lond. Journ.* iv. 598. Puberula. Foliola 2-juga, ovali-oblonga v. elliptica, nitida, majora 4–5-pollicaria. Spicæ densæ, vix demum semipollicares, longe pedunculatæ. Calyx glaber, 2 lin. longus; corolla duplo longior, sericeo-villosa. Legumen 6–10-pollicare, $\frac{3}{4}$ poll. latum.—*Fl. Bras. Mim.*

I. multiflora, Benth. ! in Hook. Lond. Journ. iv. 598.

Hab. Tropical America: North Brazil, Cayenne, British Guiana.

51. I. DUMOSA, *Benth.! in Mart. Fl. Bras. Mim.* Glabra v. pilis raris conspersa. Foliola bijuga, subsessilia, ovali-elliptica v. oblonga, nitida, majora semipedalia. Spicæ breves, densæ, longe pedunculatæ. Calyx adpresse pubescens, 2–$2\frac{1}{4}$ lin. longus; corolla sericeo-villosa, ad 5 lin. longa. Legumen pluripollicare, $\frac{3}{4}$–1-poll. latum.

I. splendens, Benth. ! in Spruce, Pl. Exs., non Willd.

Hab. Tropical America: North Brazil.

52. I. STRIGILLOSA, *Spruce ! in Mart. Fl. Bras. Mim.* Puberula. Foliola 2-juga, longiuscule petiolulata, ovali-elliptica v. oblonga, acuminata, minute pilosula, majora semipedalia. Spicæ breves, densæ, longe pedunculatæ. Calyx pubescens 2 lin., corolla sericeo-villosa 4 lin. longa. Legumen pubescens, 3–6-pollicare, $\frac{3}{4}$–1 poll. latum.

Hab. Tropical America: North Brazil.

53. I. RUFINERVIS, *Spruce !, Benth. in Mart. Fl. Bras. Mim.* Pube nitente rufescens. Foliola 2-juga, ovali-oblonga, acuminata, pagina inferiore margine nerviformi et costa paginæ superioris rufo-pubescentibus, majora 6–7-pollicaria. Spicæ breves, densæ,

pedunculatæ. Calyx adpresse pubescens, 3 lin. longus. Corolla sericeo-villosa, 6 lin. longa. Legumen ignotum.

Hab. Tropical America: North Brazil, and Eastern Peru, near Yurimaguas, *Pœppig*.

54. I. Maynensis, *Benth.*, sp. n. Ferrugineo-tomentosa, glabrescens. Foliola 2-juga, ovata v. late elliptica, coriacea, majora 3–4-pollicaria. Spicæ breves, subcapitatæ, pedunculatæ. Calyx tomentoso-pubescens, 3 lin. longus. Corolla sericeo-tomentosa, 6–7 lin. longa. Legumen sessile, basi valde obliquum, semipedale et longius, pollicem latum, glabrum.

Hab. Tropical America: Eastern Peru, near Yurimaguas, *Pœppig* (*Herb. Vind.*).

Species tomento *Euingis* accedit. Flores et fructus *Pseudingarum Gymnopodarum*. Flores quam in *I. rufinervi* longiores magisque tomentosi iis *I. nobilis* similiores. Ramuli petioli et pedunculi tomento denso molli rufescente vestiti; foliola juniora utrinque pilosa, adulta supra glabrata, subtus ad venas hirtella. Stipulæ breves, ovatæ, caducæ. Foliorum petiolus teres, 1–2-pollicaris. Glandulæ orbiculatæ, sessiles, variant parvæ v. majusculæ. Foliola subsessilia, obtusa v. brevissime acuminata, demum rigidule coriacea vix tamen nitida; venæ primariæ subtus prominulæ, venulis plus minus conspicuis; margines sæpius recurvi; foliola foliorum ramealium variant multo minora et acutiora. Pedunculi axillares, pollicares v. paullo longiores, rigiduli. Spicarum rhachis oblonga v. ovoidea, 2–3 lin. longa. Bracteæ minimæ, lineari-spathulatæ, sæpius caducæ. Flores tenues, sessiles. Stamina fere sesquipollicaria, tubo vix exserto. Legumen *I. punctatæ*, planum, glabrum, marginibus vix elevatis.

55. I. lenticellata, *Benth. in Mart. Fl. Bras. Mim.* Glabra v. vix minute pubescula. Foliola 3-juga, ovata v. oblongo-lanceolata, nitidula, majora 3–4-pollicaria. Spicæ densæ, ovatæ v. oblongæ, pedunculatæ, axillares subpaniculatæque. Calyx ½–1 lin. longus, minute pubescens. Corolla vix 3 lin. longa, cano-sericea. Legumen ignotum.

Hab. Tropical America: Brazil.

56. I. punctata, *Willd. Spec.* iv. 1016, *excl. syn.* Pilosula v. glabrescens. Foliola 2- rarius 3-juga, ovali-oblonga, acuminata, coriacea, nitidula, majora 4-pollicaria. Spicæ breves, densæ, breviter pedunculatæ, ad apices ramorum paniculatæ. Calyx appresse pilosulus, 1½ lin. longus. Corolla sericeo-villosa, 3 lin. longa. Legumen brevissime stipitatum, semipedale et longius, pollicem latum, junius pubescens, demum glabratum, planum, marginibus parum elevatis.

Mimosa sericea, Poir. Dict. Suppl. i. 42.

Hab. Tropical America: Columbia, Caraccas, *Moritz*, *Fendler* and others; Tenasiera, *Triana*.

Var. panamensis, ramulis subangulatis, glandulis majoribus, legumine subsessili.

Hab. Panama, *Seemann*, *Sutton Hayes*; Chagres, *Fendler*.

57. I. leptoloba, *Schlecht. Linnæa*, xii. 560. Puberula. Foliola 3-juga rarius 2-juga, elliptica v. ovali-elliptica, acuminata, nitidula, majora 4–6-pollicaria. Spicæ breves, densæ, in axillis longiuscule pedunculatæ. Calyx 2 lin., corolla sericeo-pubescens 4 lin. longa. Legumen brevissime stipitatum, puberulum, semipedale et longius, ¾ poll. latum, planum, demum incrassatum.

Hab. Tropical America: New Spain, *Herb. Pavon*; Mexico, *Schiede*, *Bourgeau*, n. 2396; Costa Rica, *Œrsted*; Veraguas, *Seemann*.

58. I. lineata, *Benth. in Hook. Lond. Journ.* iv. 594. Ferrugineo-pubescens. Foliola

3-juga, ovali-elliptica, acuminata, majora 6–7-pollicaria, venis numerosis parallelis utrinque prominulis. Spicæ ovoideæ subcylindraceæ, pedunculatæ, ad axillas fasciculatæ v. superiores breviter racemosæ. Calyx vix lineam longus, pilosulus. Corolla 2 lin. longa, villosa. Legumen ignotum.

Hab. Tropical America: Tarapoto in Eastern Peru, *Mathews* n. 1594.

59. I. JUGLANDIFOLIA, *Willd. Spec.* iv. 1018. Ferrugineo-pubescens. Foliola 2–4-juga, oblonga, acuminata, majora 6–7-pollicaria, tenuiter coriacea, venis venulisque utrinque conspicuis. Petiolus eglandulosus. Spicæ axillares, pedunculatæ, subfasciculatæ. Corolla villosa. Legumen planum.

Mimosa juglandifolia, Poir. Dict. Suppl. i. 44.

Hab. Tropical America: Caraccas, *Bredemeyer.*

The only specimen I have seen of this species is from Bredemeyer, in the Vienna Herbarium, and is only in young bud. It is very near the large-leaved forms of *I. nobilis,* but appears to be always without petiolar glands.

60. I. NOBILIS, *Willd.! Enum. Hort. Berol.* 1047. Glabra v. puberula. Foliola 3–4-juga, ovata oblongo-elliptica v. oblongo-lanceolata, acuminata, majora subsemipedalia, tenuiter coriacea, venis venulisque utrinque conspicuis. Glandulæ depressæ v. scutellatæ. Spicæ breves, ovoideæ, pedunculatæ, ad apices ramorum fasciculato-paniculatæ. Calyx pubescens, $2\frac{1}{2}$ rarius 3 lin. longus. Corolla sericeo-villosa, 5 rarius 6 lin. longa. Legumen 4–6-pollicare, 9–10 lin. latum, tomentellum v. glabratum.—*Benth. in Fl. Bras. Mim.*

I. Humboldtiana, Kunth.! in H., B. et K. Nov. Gen. et Sp. vi. 285.

I. corymbifera, Benth.! in Hook. Journ. Bot. ii. 144; Lond. Journ. iv. 595.

I. Riedeliana, Benth.! in Hook. Lond. Journ. iv. 595.

I. sericantha, Miq.! in Linnæa, xix. 132.

Hab. Tropical America: North Brazil, Guiana, Columbia, Ecuador, apparently common and widely spread.

Var.? PAVONIANA, floribus pedicellatis.

I. Pavoniana, Benth.! in Hook. Lond. Journ. iv. 595, non G. Don.

Hab. Lima, *Mathews,* from *Herb. Pavon.*

The venation of the leaflets distinguishes this species from most of those allied to it.

61. I. ACROCEPHALA, *Steud.! in Flora,* 1843, 759. Puberula, foliis glabratis. Foliola sub-4-juga, ovali- v. elliptico-oblonga, acuminata, majora semipedalia, coriacea, nitida. Spicæ ovoideo-capitatæ, parvæ, numerosæ, breviter pedunculatæ, paniculatæ. Flores pubescentes. Calyx $1\frac{1}{2}$–2 lin., corolla vix 3 lin. longa. Legumen ignotum.

Hab. Tropical America: Surinam, *Hostmann.*

62. I. RUIZIANA, *G. Don! Gen. Syst.* ii. 391. Tomentoso-puberula, mox glabrata. Foliola 4–6-juga, elliptico- v. anguste oblonga, acuminata v. obtusa, majora 6–10-pollicaria, coriacea, nitida, venis supra impressis subtus prominulis, venulis inconspicuis. Spicæ ovoideæ, tomentosæ, breviter pedunculatæ, paniculatæ. Calyx $1\frac{1}{2}$ rarius 2 lin. longus. Corolla sericeo-pubescens, 3 rarius 4 lin. longa. Legumen puberulum v. glabratum, semipedale, $\frac{3}{4}$–1 poll. latum.—*Benth. in Fl. Bras. Mim.*

I. fagifolia, G. Don! Gen. Syst. ii. 391, non Willd.

I. foliosa, Benth.! in Hook. Lond. Journ. iv. 597.

Hab. Tropical America: North Brazil, Eastern Peru, *Ruiz, Mathews* n. 1923, *Pœppig*; and apparently the same species, Panama, *Sutton Hayes*.

63. I. MATHEWSANA, *Benth.! in Hook. Lond. Journ.* iv. 594. Ferrugineo-pubescens. Foliola 5–6-juga, oblonga, acuminata, majora 4–5-pollicaria, venis venulisque utrinque conspicuis. Spicæ ovoideæ, pedunculatæ, ad axillas fasciculatæ v. breviter racemosæ. Calyx pubescens, 3 lin., corolla sericeo-villosa, 5 lin. longa. Legumen ignotum.

Hab. Tropical America: Eastern Peru, near Mozobamba, *Mathews*.

64. I. MULTIJUGA, *Benth.*, sp. n. Ferrugineo-tomentella. Foliola 7–10-juga, oblonga, subacuminata, basi rotundata, 2–4-pollicaria, utrinque puberula, pennivenia, venulis parum conspicuis. Spicæ ovoideæ, ad axillas pedunculatæ. Calyx pubescens, 4 lin., corolla sericeo-villosa, fere pollicem longa. Legumen ignotum.

Hab. Tropical America: Panama, *Sutton Hayes*, *Fendler* n. 51, and perhaps a variety with rather smaller flowers, Costa Rica, *Œrsted*.

Arbor 20–40-pedalis. Foliorum petiolus 6–8-pollicaris. Glandulæ scutellatæ.

65. I. THIBAUDIANA, *DC.! Prod.* ii. 434. Ferrugineo-tomentella. Petiolus nudus v. anguste alatus; glandulæ sæpius magnæ elevatæ; foliola 4–5-juga, ovali-oblonga v. elliptica, acuminata, majora 4–5-pollicaria, pennivenia, venulis parum conspicuis. Spicæ breves, axillares v. paniculatæ. Calyx 2–3 lin., corolla $\frac{3}{4}$–1 poll. longa. Legumen fulvo-tomentosum, demum glabratum, $\frac{1}{2}$–1-pedale, $\frac{3}{4}$–1 poll. latum.—*Benth. in Fl. Bras. Mim.*

I. gladiata, Desv.! in Ann. Sc. Nat. ser. 1, ix. 427.

I. macradenia, Mart.! Fl. Bras. n. 1096.

I. tenuiflora, Salzm.! Benth. in Hook. Lond. Journ. iv. 596, errore typogr. *I. tenuifolia*.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Bahia, and Para; Cayenne, Surinam, British Guiana, and, apparently the same, Tarapoto in Eastern Peru, *Spruce* n. 4915; and Cape Corrientes in Ecuador, *Seemann*.

(See also 70. *I. stenoptera*, 78. *I. Salzmanniana*, and 79. *I. nuda*, in which the petiole is sometimes wingless).

Series 3. Pilosiusculæ. *Petiolus inter foliolorum paria alatus v. rarius subnudus. Glandulæ sessiles v. subsessiles. Bracteæ parvæ v. caducæ. Calyx tubulosus, pilosus, laxe pubescens v. rarius subglaber. Corolla tenuis, dense sericeo-villosa, pollice brevior. Legumen ubi notum planum, marginibus parum elevatis.*

66. I. SPLENDENS, *Willd.! Spec.* iv. 1017. Glabra v. vix puberula. Petiolus anguste alatus; glandulæ magnæ; foliola 2-juga, ovali-elliptica, rigide coriacea, nitida, majora 6–8-pollicaria. Spicæ breviter pedunculatæ, corymbosæ. Calyx 4–5 lin. longus, pubescens. Corolla $\frac{3}{4}$ poll., rarius fere pollicem longa, sericeo-villosa. Legumen crassiusculum, semipollice latius.—*Benth. in Fl. Bras. Mim.*

Mimosa splendens, Poir. Dict. Suppl. i. 43.

Inga floribunda, Benth.! in Hook. Journ. Bot. ii. 143, Lond. Journ. iv. 606.

Hab. Tropical America: North Brazil, Surinam, British Guiana, Venezuela on the Orinoco, *Spruce* n. 3664.

6. I. SETIFERA, *DC.! Prod.* ii. 432. Rufo-pilosa. Petiolus alatus, apice longe

setifer; foliola 2-juga, ovata, coriacea, majora ad 10 poll. longa, utrinque pilosula. Spicæ densæ, longiuscule pedunculatæ. Calyx pilosulus, $3\frac{1}{2}$ lin. longus. Corolla sericeo-villosa, 6–7 lin. Legumen subsemipedale, 1–$1\frac{1}{2}$ poll. latum, nitens, appresse pilosum v. glabratum.—*Benth. in Fl. Bras. Mim.*

I. platycarpa, Benth.! in Hook. Journ. Bot. ii. 142.

I. macrophylla, Hook.! Bot. Mag. t. 5075, non Humb. et Bonpl.

I. affinis, Steud.! in Flora, 1843, 758.

I. versicolor, Spruce! Pl. Exs.

Hab. Tropical America: North Brazil, Surinam, Cayenne, British Guiana, Trinidad, *Crueger.*

68. I. PILOSIUSCULA, *Desv.! Journ. Bot.* 1814, i. 71. Pilosula v. subglabra. Petiolus late alatus; foliola 2-juga, rarius 3-juga, ovata v. ovali-oblonga, tenuiter coriacea, nitida, majora 4–6-pollicaria, adulta glabra. Spicæ densæ, longe pedunculatæ. Calyx pilosulus 3–4 lin., corolla sericeo-villosa, 6–7 lin. longa. Legumen ignotum.—*Benth. in Fl. Bras. Mim.*

Mimosa pilosula, Rich.! in Act. Soc. Hist. Nat. Par. 1792, 113.

Mimosa lucida, Vahl! Ecl. iii. 31, t. 24.

Hab. Tropical America: North Brazil, Cayenne.

69. I. NITIDA, *Willd.! Spec.* iv. 1013. Glabra v. parce pilosula. Petiolus late nunc breviter alatus; foliola 2-juga, ovato-oblonga, tenuiter coriacea, nitida, majora 4–6-pollicaria, glabra. Spicæ densæ, longiuscule pedunculatæ. Calyx parce pilosulus, 2–$2\frac{1}{2}$ lin., corolla sericeo-villosa, 4–5 lin. longa. Legumen ignotum.—*Benth. in Fl. Bras. Mim.*

Mimosa nitida, Poir. Dict. Suppl. i. 41.

Inga quassiæfolia, Willd.! Spec. iv. 1013.

Mimosa quassiæfolia, Poir. l.c.

Hab. Tropical America: North Brazil.

This differs from the preceding chiefly in the smaller flowers. Willdenow's specimen of *I. quassiæfolia* has peduncles about 1 in. long, and of *I. nitida* nearly 3 in.; but they appear to me to be otherwise the same; and some of Burchell's are intermediate in the length of the peduncles.

70. I. STENOPTERA, *Benth.! in Hook. Journ. Bot.* ii. 143.; *Lond. Journ.* iv. 599. Pilosula. Petiolus anguste alatus v. hinc inde subnudus; foliola bijuga, ovali-oblonga, tenuiter coriacea, nitida, majora 5–6-pollicaria, demum glabrata. Spicæ breves, longe pedunculatæ. Calyx pubescens, 3 lin., corolla sericeo-villosa 6–7 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: North Brazil; Eastern Peru, near Tarapoto, *Spruce.*

Var. PEDUNCULARIS. Foliola majora 10-pollicaria. Petiolus subnudus.

I. peduncularis, Benth.! in Hook. Lond. Journ. iv. 599.

Hab. North Brazil.

71. I. CHARTACEA, *Pœpp. et Endl.! Nov. Gen. et Sp.* iv. 79. Junior ferrugineo-hirta, mox glabrata. Petiolus alatus; foliola 3-juga, ovali- v. obovali-elliptica, acuminata, tenuia, rigidula, nitida, subsemipedalia, nervis subtus valde prominentibus. Spicæ densæ, subglobosæ, pedunculis fasciculatis. Calyx pilosulus, $1\frac{1}{4}$ lin., corolla sericeo-villosa, $2\frac{1}{2}$ lin. longa. Legumen ignotum.

Hab. Tropical America: Eastern Peru, prov. Maynas, *Pœppig*.

This has the small flowers of *I. acrocephala*, but is easily distinguished by the winged petiole and other characters.

72. I. MARITIMA, *Benth.! in Hook. Lond. Journ.* iv. 601. Pubescens. Petiolus alatus; foliola 2–3-juga, ovali-oblonga v. elliptica, sæpius obtusa, coriacea, majora 3-pollicaria. Spicæ densæ, ad apices ramorum confertæ. Calyx adpresse pubescens, vix 2 lin., corolla sericeo-villosa, 4 lin. longa. Legumen puberulum v. hirtum, 4–6-pollicare, 9 lin. latum. —*Fl. Bras. Mim.*

I. Velloziana, Mart.! Herb. Fl. Bras. 118 quoad specimina, excl. syn. Vell.

Hab. Tropical America: Brazil, prov. Rio Janeiro.

73. I. HAYESII, *Benth.*, sp. n. Pubescens. Petiolus alatus; foliola 2–4-juga, elliptico-oblonga, acuminata, 2–4-pollicaria. Glandulæ parvæ. Spicæ breves, densæ, ad axillas v. apices ramorum subsessiles. Calyx 3 lin., corolla sericeo-villosa, 6 lin. longa. Legumen ignotum.

Hab. Tropical America: Panama, *Sutton-Hayes*.

Frutex 10–15-pedalis, *I. maritimæ* subaffinis, sed foliola minus coriacea, diu pilosula, spicæ vix pedunculatæ et flores majores latiores.

74. I. DENSIFLORA, *Benth.*, sp. n. Ferrugineo-pubescens. Petiolus alatus; foliola 3–5-juga, elliptico-oblonga, acuminata, supra nitida subglabra, subtus pubescentia, 5–6-pollicaria. Glandulæ parvæ. Spicæ densæ, ad apices ramorum confertim corymbosæ. Calyx $1\frac{1}{2}$–2 lin., corolla sericea, 4 lin. longa. Legumen pedale, 2 poll. latum, crassum, durum, transverse lineatum.

Hab. Tropical America: Eastern Peru, near Tarapoto, *Spruce*, n. 4504; and, apparently the same, at Ibague in New Granada, *Triana*.

Spicæ ad apices ramorum secus rhachin 2–3-pollicarem fasciculatæ, singulæ $\frac{1}{2}$–1-pollicares, pedunculo $\frac{1}{2}$–$\frac{3}{4}$-pollicari fultæ. Flores in spica dense conferti.

75. I. BONPLANDIANA, *Kunth in H., B. et K., Nov. Gen. et Sp.* vi. 288. Glabra. Petiolus alatus; foliola 5-juga, elliptico-oblonga, acuta, subcordata, subcoriacea, supra nitida, 5–6-pollicaria. Spicæ pedunculatæ? Flores sessiles. Calyx tubulosus; corolla duplo longior, tubulosa, sericea. Legumen complanatum, glabrum, 2–4-pollicare, marginibus incrassatis.

Hab. Tropical America: prov. Jaen de Bracamoras, *Humboldt and Bonpland*.

Kunth only saw a leaf of this plant; his description of the flower is taken from Bonpland's notes. I have been unable to identify the species, which remains very doubtful.

I. pisana, G. Don, Gen. Syst. ii. 388 (*Mimosa pisana*, Pav.), from Peru, which I have not seen, may possibly be the same species; but the character given is insufficient for identification.

76. I. VIRESCENS, *Benth.! in Hook. Lond. Journ.* iv. 605. Hirtella. Petiolus alatus; foliola 4–5-juga, ovato-lanceolata, submembranacea, venis venulisque utrinque conspicuis, majora 3-pollicaria. Spicæ densæ, pedunculatæ, ad nodos defloratos fasciculatæ. Calyx $2\frac{1}{2}$ lin. longus, parce pilosus. Corolla densius sericeo-pilosa, 4 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, *Sello* (*Herb. Berol.*).

77. I. LONGIPES, *Benth.*, sp. n. Ferrugineo-tomentosa. Petiolus late alatus; foliola

4-juga, ovata, coriacea, supra glabrata, subtus velutina, majora 8–9-pollicaria. Spicæ densæ, pedunculo semipedali v. longiore. Calyx semipollicaris. Corolla villosissima, ¾ poll. longa. Legumen ignotum.

Hab. Tropical America: Eastern Peru, *Spruce* n. 4935.

Arbor 25-pedalis, coma patula. Foliorum petiolus crassus, 6–8-pollicaris, undique alatus, alis interdum utrinque semipollicem latis. Foliola venis supra impressis subtus valde elevatis fere bullata, sæpe 5 poll. lata. Pedunculi erecti, rigidi, ferrugineo-tomentosi. Stamina 2½-pollicaria, flavo-viridia, tubo incluso.

78. I. SALZMANNIANA, *Benth. ! in Hook. Lond. Journ.* iv. 608. Minute puberula. Petiolus anguste alatus; foliola 4–5-juga, obovali- v. oblongo-elliptica, acuminata, submembranacea, majora 4–5-pollicaria. Spicæ densæ, breviter pedunculatæ, ad apices ramorum corymbosæ. Calyx striatus, puberulus, 3–3½ lin. longus. Corolla sericeo-villosa, 6–7 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia and Para.

79. I. NUDA, *Salzm. ! Benth. in Hook. Lond. Journ.* iv. 607. Parce hirtella. Petiolus breviter et anguste alatus v. nudus; foliola 3–4-juga, elliptico-oblonga v. ovato-lanceolata, demum glabrata, majora 5–6-pollicaria. Spicæ ovoideæ, densæ, breviter pedunculatæ, subcorymbosæ. Calyx striatus, subglaber, 3–4 lin. longus. Corolla sericeo-villosa, 6–7 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia; Cayenne.

Var.? LONGIFLORA, calyce semipollicari, corolla fere pollicari.

Hab. Cayenne, *Poiteau* (*Herb. Berol.*).

(See also 65. *I. Thibaudiana*, and an occasional specimen of some other *Gymnopodæ* with the petioles slightly winged.)

80. ? I. PRURIENS, *Pœpp. et Endl. Nov. Gen. et Sp.* iii. 78. Piloso-hirta pilis fragilibus. Petioli alæ oblongæ, apice basique angustæ; foliola 2–3-juga, ampla, elliptico-obovata, obtusa, basi cuneato-rotundata, rigidissima, supra glabra, basin versus glandula cupuliformi instructa, subtus hirte pilosa, terminalia 10-pollicaria. Spicæ solitariæ, sessiles. Calyx corollaque hirsuta. Legumen ignotum.

Hab. Tropical America: Eastern Peru, *Pœppig.*

I have seen no specimen answering to the above character; and Pœppig had it in bud only. It may be therefore doubtful whether it belongs really even to the Order. I have seen no *Inga* with a gland on the surface of the leaflets.

Series 4. Leptanthæ. *Petiolus inter foliolorum paria latiuscule alatus. Glandulæ sessiles v. stipitatæ. Bracteæ persistentes, calycem sæpius æquantes v. superantes. Flores tenues. Calyx striatus, glaber v. appresse pilosus. Corolla apice pilosa, v. undique sericeo-villosa.*

81. I. ACUMINATA, *Benth. ! in Hook. Lond. Journ.* iv. 600. Glabra v. vix pilosula. Foliola 2–3-juga, ovato-lanceolata v. ovali-oblonga, acuminata, glabra, lævia, nitida, majora 4–5-pollicaria. Glandulæ subsessiles. Spicæ ovoideo-globosæ, pedunculatæ. Bracteæ persistentes, calyce breviores. Calyx glabriusculus, insigniter acuminatus, 4 lin. longus. Corolla hirsutissima, semipollicaris. Legumen ignotum.

Hab. Tropical America: Trinidad.

The species differs from all others known to me in the remarkably acuminate flower-buds.

82. I. CILIATA, *Presl! Symb.* ii. 11, t. 58. Pilosula. Glandulæ subsessiles; foliola 4–5-juga, ovali- v. anguste oblonga, acuminata, tenuia, lævia, nitida, majora 1–2-pollicaria. Spicæ paucifloræ, pedunculo tenui. Bracteæ setaceæ, calycem subæquantes. Calyx striatus, parce pilosus, $1\frac{1}{2}$–2 lin. longus. Corolla subsericeo-pilosa, 5–6 lin. longa. Legumen 3–4-pollicare, 5–9 lin. latum, hirsutum.—*Benth: in Fl. Bras. Mim.*

I. cærulescens, Walp.! in Linnæa, xiv. 298.

I. fagaræfolia, Mart.! Herb. Fl. Bras. n. 1093.

I. microphylla, Salzm. Pl. Exs.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Bahia and Pernambuco.

83. I. LEPTANTHA, *Benth.! in Hook. Lond. Journ.* iv. 603. Pilosa. Glandulæ stipitatæ; foliola 2–4-juga, lanceolata, acuta, tenuia, lævia, nitida, majora 3–4-pollicaria. Spicæ laxæ, pedunculo tenui. Bracteæ lineares, persistentes, calycem æquantes. Calyx striatus, pilosulus, 2–$2\frac{1}{2}$ lin. longus. Corolla hirsutissima, ad 7 lin. longa. Legumen sessile, pilis longis rufis hirsutum, 4–6-pollicare, fere pollicem latum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro and Bahia.

I. angustifolia, Willd. Spec. iv. 1012 (*Mimosa sinemariensis,* Poir. Dict. Suppl. i. 40, non aliorum), must remain among the plants not now to be determined. It was described from a Caracas specimen of Bredemeyer's, in leaf only. Willdenow's herbarium comprises a single leaf of it, which might be referred to a barren branch of *I. leptantha,* but that it is entirely without hairs. A specimen in leaf of a Cayenne plant from Sagot very closely resembles it, but cannot yet be satisfactorily identified.

84. I. STRIATA, *Benth.! in Hook. Lond. Journ.* iv. 608. Rufo-villosula. Glandulæ parvæ substipitatæ: foliola 4–5-juga, ovata v. oblongo-elliptica, utrinque villosula, majora subsemipedalia. Spicæ pedunculatæ, ovoideæ v. demum elongatæ. Bracteæ lineares, persistentes, calycem æquantes. Calyx striatus, ad 4 lin. longus, parce pilosulus. Corolla sericeo-villosa, 7–10 lin. longa. Legumen crassum, ferrugineo-villosum, semipedale, 7–10 lin. latum, marginibus valde elevatis.

I. Catharinæ, Benth.! in Hook. Lond. Journ. iv. 605.

Hab. Tropical or subtropical South America: Brazil, prov. Rio Janeiro, Sao Paulo, and Minas Geraes, and perhaps also Bolivia.

This species ought, perhaps, to be removed to the *Calocephalæ,* notwithstanding its small flowers: it differs from all the preceding ones in the foliage, which is that of several species of *Euinga.*

A Bolivian specimen from Sorato, *Mandon,* n. 761, is in some measure intermediate between this and *I. Pavoniana,* Don, which differs chiefly in the much greater length of the flowers.

85. I. DISTICHA, *Benth.! in Hook. Journ. Bot.* ii. 143; *Lond. Journ.* iv. 603. Pilis ferrugineis conspersa. Glandulæ parvæ; foliola 4–5-juga, ovali- v. anguste oblonga, acuminata, membranacea, nitidula, majora 3–4-pollicaria. Spicæ pedunculatæ, laxæ, distichæ. Bracteæ ovato-lanceolatæ, calyce parum breviores, persistentes. Calyx $3\frac{1}{2}$ lin. longus, strigosus. Corolla hirsutissima, 9–10 lin. longa. Legumen rufo-villosum (semipedale?), ad pollicem latum.

Hab. Tropical America: British Guiana, *Schomburgk.*

86. I. PLATYPTERA, *Benth.! in Hook. Lond. Journ.* iv. 602. Rufo-hirsuta. Glandulæ turbinatæ; foliola 2–3-juga, ovata v. oblongo-lanceolata, utrinque pilosa, majora 5–7-pollicaria. Spicæ oblongæ, pedunculatæ. Bracteæ lanceolatæ, persistentes, calyce multo

longiores. Calyx 3–4 lin. longus, striatus, pilosus. Corolla subpollicaris, dense pilosa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro.

Series 5. Longifloræ. *Petiolus alatus. Glandulæ sessiles v. brevissime stipitatæ. Bracteæ caducæ v. minimæ. Flores angusti, ultrapollicares. Calyx tubulosus, glaber v. villosus. Corolla sericeo-villosa. Legumen ubi notum planum, crassum, rufo-villosum.*

87. I. Pœppigiana, *Benth.! in Hook. Lond. Journ.* iv. 602. Pilosa. Foliola 3-juga, ovali-oblonga, acuminata, majora 4–5-pollicaria, supra nitida, utrinque pilosa. Spicæ oblongæ, sessiles. Bracteæ ovatæ, breves. Calyx $\frac{3}{4}$-pollicaris, vix ciliatus. Corolla 2 poll. longa, apice pilosa. Staminum tubus longe exsertus. Legumen ignotum.

I. ciliata, Pœpp. et Endl. ! Nov. Gen. et Sp. iii. 78, non Presl.

Hab. Tropical America: Eastern Peru, prov. Maynas, *Pœppig*.

The specimens I saw in the Vienna Herbarium had the flowers almost destroyed by worms.

88. I. longiflora, *Spruce! in Mart. Fl. Bras. Mim.* Rufo-hispida, glabrescens. Foliola 2-juga, longe oblongo- v. ovali-elliptica, acuminata, coriacea, nitida, majora 8–9-pollicaria. Spicæ densæ, breviter pedunculatæ. Flores pedicellati. Calyx glaber, 7–8 lin. longus. Corolla sericeo-pilosa, $1\frac{1}{2}$-pollicaris v. paullo longior. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: North Brazil, *Spruce*.

89. I. micradenia, *Spruce! Benth. in Fl. Bras. Mim.* Ferrugineo-hirsuta. Foliola 3-juga, oblonga v. sublanceolata, acuminata, membranacea, utrinque pilosa, majora 4-pollicaria. Spicæ pedunculatæ. Flores sessiles. Calyx semipollicaris, pilosus. Corolla 1–$1\frac{1}{4}$ poll. longa, sericeo-pilosa. Staminum tubus inclusus. Legumen ignotum.

Hab. Tropical America: North Brazil, *Spruce*.

This species in some measure connects the *Longifloræ* with the *Vulpinæ*. The glands are very shortly stipitate, as in *I. longiflora*,

90. I. speciosa, *Spruce !, Benth. in Mart. Fl. Bras. Mim.* Rufo-pubescens. Foliola 3-juga, oblongo- v. ovali-elliptica, subobtusa, pubescentia, in forma typica 4-pollicaria, glandulis parvis. Spicæ brevissime pedunculatæ. Flores sessiles. Calyx molliter sericeus, 4 lin. longus. Corolla sericeo-villosa, $1\frac{1}{4}$ lin. longa. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: North Brazil, *Spruce*.

Var. lomatophylla. Foliola 8–9-pollicaria, margine nerviformi dense hirtello cincta. Glandulæ majores. Flores longiores.

Hab. North Brazil, *Spruce*.

91. I. velutina, *Willd.! Spec.* iv. 1014. Ferrugineo-pubescens v. villosa. Foliola 2–3-juga, ovalia, obtusa, pubescentia, majora 6–10-pollicaria. Spicæ pedunculatæ. Flores sessiles. Calyx rufo-sericeus, 8–9 lin. longus. Corolla sericeo-villosa, subsesquipollicaris. Staminum tubus sæpius exsertus. Legumen crassum, densissime rufo-hispidum, semipedale et longius, 1–$1\frac{1}{4}$ poll. latum.—*Benth. in Fl. Bras. Mim.*

Mimosa velutina, Poir. Dict. Suppl. i. 42.

Hab. Tropical America: North Brazil.

92. I. PLUMIFERA, *Spruce!*, *Benth. in Mart. Fl. Bras. Mim.* Ferrugineo-tomentosa. Foliola 4–5-juga, ovali- v. oblongo-elliptica, acuminata, pilosula, majora semipedalia. Spicæ breviter pedunculatæ. Flores sessiles, dissiti. Calyx semipollicaris, rufo-villosus. Corolla dense sericeo-villosa, sesquipollicem excedens. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: North Brazil, *Spruce.*

93. I. NEGRENSIS, *Spruce !*, *Benth. in Mart. Fl. Bras. Mim.* Ferrugineo-hirta. Foliola 4–5-juga, oblongo-elliptica, acuminata, pilosula, majora 3–4-pollicaria. Spicæ breviter pedunculatæ. Flores sessiles, dissiti. Calyx striatus, pilosus, ad 5 lin. longus. Corolla dense sericeo-villosa, pollicem parum excedens. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: North Brazil, *Spruce.*

Series 6. Calocephalæ. *Petiolus alatus v. rarius subnudus. Glandulæ sessiles. Bracteæ persistentes. Flores pollicares v. longiores, quam in seriebus præcedentibus sæpius latiores. Calyx tubulosus v. campanulatus, sæpius striatus. Corolla sericeo-villosa v. setosa. Legumen ubi notum planum, crassum, marginibus vix v. valde elevatis.*

94. I. OBTUSATA, *Spruce ! Benth. in Mart. Fl. Bras. Mim.* Rufo-tomentosa. Petiolus subnudus; foliola 3–4-juga, late ovata, obtusissima, coriacea, pubescentia, semipedalia. Spicæ brevissimæ, pedunculatæ, dense corymbosæ. Bracteæ ovatæ, imbricatæ, semipollicares longioresque. Calyx sericeo-pubescens, 3–3½ lin. longus. Corolla dense sericeo-pilosa, sesquipollicem excedens. Legumen crassum, villosum, 6–10-pollicare, ¾–1 poll. latum, marginibus vix elevatis.

Hab. Tropical America: North Brazil, *Spruce.*

95. I. SPECTABILIS, *Willd. Spec.* iv. 1017. Glabra. Ramuli angulati. Petiolus nudus v. anguste alatus; foliola 2-rarius 3-juga, ovali-elliptica, obtusa v. breviter acuta, coriacea, nitida, semipedalia et longiora. Spicæ oblongæ, pedunculatæ. Bracteæ ovato-lanceolatæ, calyce longiores. Calyx 3–4 lin. longus. Corolla sericeo-hirta, subpollicaris. Legumen 1–2-pedale, 3 poll. latum, crassum, planum, glabrum, marginibus non elevatis.

Mimosa spectabilis, Vahl! in Skrift. Nat. Selsk. Kjöbenh. 1792, ii. pars i. 219, t. 10.
Inga fulgens, Kunth, Mim. 36, t. 11, staminibus rubris.
I. lucida, H., B. et. K. Nov. Gen. et Sp. vi. 287, staminibus albis.

Hab. Tropical America: Santa Marta, *v. Rohr*; New Granada, *Humboldt and Bonpland, Triana, Linden* n. 466; Chagres, *Fendler* n. 67.

96. I RUFISETA, *Benth. in Mart. Fl. Bras. Mim.* Longe rufo-setosa. Stipulæ amplæ, diu persistentes. Petiolus nudus; foliola 3–5-juga, oblonga, nitida, ½–1-pedalia. Spicæ ovoideæ, pedunculatæ. Bracteæ oblongæ v. lineares, persistentes. Calyx glaber, 8–9 lin. longus. Corolla parce setosa, 1¼ poll. longa. Staminum tubus longe exsertus. Legumen ignotum.

I. stipulacea, G. Don! Gen. Syst. ii. 391, non *I. stipularis*, DC.
I. setigera, Pœpp. et Endl.! Nov. Gen. et Sp. iii. 80, non *I. setifera*, DC.

Hab. Tropical America: Eastern Peru, and perhaps North Brazil.

97. I. MACROPHYLLA, *Humb. et Bonpl. in Willd. Spec.* iv. 1015. Parce pilosula v. glabra. Ramuli crassi, angulati. Petiolus alatus; foliola 3–4-juga, ovata, acuta, nitida, majora semipedalia et longiora. Spicæ ovoideæ, pedunculatæ, superiores corymbosæ. Bracteæ ovato-lanceolatæ, persistentes. Calyx striatus, parce pilosus, $\frac{3}{4}$-pollicaris. Corolla dense sericeo-villosa, $1\frac{1}{4}$–$1\frac{1}{2}$ poll. longa. Legumen ignotum.

Mimosa macrophylla, Poir. Dict. Suppl. i. 42.

Inga calocephala, Pœpp. et Endl.! Nov. Gen. et Sp. iii. 78.

Hab. Tropical America: Eastern Peru, *Pœppig*; North Brazil, *Spruce*, *Riedel*; and, if rightly determined, on the Orinoco, *Humboldt and Bonpland*.

I have seen leaves only of Humboldt's plant; its identification must therefore remain uncertain; but I have every reason to believe it to be correct.

98. I. BRACHYPTERA, *Benth.! in Hook. Lond. Journ.* iv. 610. Parce hirtella. Ramuli crassi angulati. Petiolus apice breviter alatus; foliola 3-juga, ovali-elliptica, acuminata, nitida, semipedalia et longiora. Spicæ ovoideæ, pedunculatæ. Bracteæ ovatæ, persistentes. Calyx striatus, 6–8 lin. longus. Corolla sericeo-hirsutissima, ultrapollicaris. Legumen hirsutissimum, junius jam 6–8 poll. longum, marginibus valde elevatis.

Hab. Tropical America: Tumaco in Columbia, *Hinds*.

99. I. HETEROPTERA, *Benth.! in Hook. Lond. Journ.* iv. 611. Glabrescens. Ramuli crassi, angulati. Petiolus alatus; foliola 3-juga, ovali-elliptica, acuminata, nitida, subpedalia. Spicæ ovoideæ, longe pedunculatæ. Bracteæ ovatæ. Calyx 3–$3\frac{1}{2}$ lin. longus, puberulus. Corolla sericeo-hirsutissima, fere pollicaris. Staminum tubus exsertus. Legumen "ei *I. brachypteræ* simile."

Hab. Tropical America: San Pedro in Columbia, *Hinds*.

The three preceding species require further comparison from a more perfect series of specimens; but they appear to me to be quite distinct from each other.

100. I. BRACTEOSA, *Benth.! in Hook. Lond. Journ.* iv. 609. Parce hirtella. Ramuli crassi, angulati. Petiolus nudus; foliola 3-juga, ovali-elliptica, breviter acuminata, $\frac{1}{2}$–1-pedalia. Spicæ ovoideæ, densæ, pedunculatæ. Bracteæ lanceolatæ, acuminatissimæ, calyces æquantes. Calyx glabriusculus, pollicaris v. longior. Corolla hirsutissima, $1\frac{3}{4}$ poll. longa. Staminum tubus longe exsertus. Legumen ignotum.

Hab. Tropical America: British Guiana, *Schomburgk*; Cayenne, *Poiteau* (*Herb. Berol.*).

101. I. LINDENIANA, *Benth.! in Hook. Lond. Journ.* iv. 608. Dense rufo-hirsuta v. velutina. Petiolus alatus; foliola 3-juga, ovata, acuminata, membranacea, majora 9-pollicaria. Spicæ oblongæ, pedunculatæ. Bracteæ lineari-lanceolatæ. Calyx pilosulus, 5–8 lin. longus. Corolla sericeo-villosa, subpollicaris. Legumen $\frac{1}{2}$–1-pedale (v. longius?), 2–$2\frac{1}{2}$ poll. latum, dense rufo-villosissimum, crassum, immaturum planum, demum tortuosum.

I. Mucuna, Walp. et Duchass.! in Walp. Ann. ii. 459.

Hab. Tropical America: Caracas, *Fendler*; Chagres, *Fendler*; Panama, *Duchassaing*; Teapa, *Linden*.

102. I. PANAMENSIS, *Seem.! Bot. Her.* 117. Rufo-pilosula, glabrescens. Stipulæ ovatæ v. oblongæ, persistentes. Petiolus alatus; foliola 2–3-juga, ovata v. elliptico-oblonga, breviter acuminata, membranacea, glabriuscula, majora semipedalia. Spicæ pedunculatæ. Bracteæ lineares v. sublanceolatæ, calycem æquantes. Calyx pubescens, 3–3½ lin. longus. Corolla sericeo-pubescens, 8–9 lin. longa. Legumen glabrum, crassum, semipedale et longius, 1½ poll. latum, marginibus valde elevatis.

Hab. Tropical America: Panama, *Seemann, Sutton Hayes*; New Granada, *Linden* n. 366. *Schlim's* n. 256, from Ocaña is also very near, if not identical with this species.

103. ? I. SAPINDOIDES, *Willd. Spec.* iv. 1012. Pilosula. Petiolus alatus; foliola 4–5-juga, oblonga, acuminata, submembranacea, læte virentia, ad 4 poll. longa. "Spicæ oblongæ, pedunculatæ. Flores glabri. Legumen glabrum, lineare, pedale."

Mimosa sapindoides, Poir. Dict. Suppl. i. 40.

Hab. Tropical America: Caracas, *Bredemeyer.*

Of this, Willdenow's herbarium contains a specimen, in leaf only, which is not unlike that of *I. panamensis*; and Willdenow had not seen the flowers, which, on the authority of Bredemeyer, he says, are glabrous, thus removing the species from all the *Pseudingæ* except the first small series, consisting of plants of a very different aspect.

104. I. PAVONIANA, *G. Don! Gen. Syst.* ii. 388. Rufo-pubescens. Petiolus alatus; foliola 3–4-juga, ovato-lanceolata v. ovali-oblonga, acute acuminata, ½–1-pedalia, utrinque puberula, subtus elevato-venosa. Spicæ pedunculatæ, demum elongatæ. Bracteæ lineares, persistentes. Calyx striatus, pubescens, 5–6 lin. longus. Corolla sericeo-villosa, 1¼ poll. longa. Staminum tubus breviter exsertus. Legumen (si rite huc relatum) 3½-pollicare v. longius, 1 poll. latum, glabrum, crassum, marginibus valde elevatis.

Hab. Tropical America: Peru, *Ruiz and Pavon*; Casapi, *Mathews* n. 307 and 1924; Tarapoto, *Spruce* n. 4503.

Some Bolivian specimens from Weddell closely connect this with the much smaller-flowered Brazilian *I. striata.*

Series 7. Vulpinæ. *Foliola et ramuli piloso-hirti v. setosi. Petiolus alatus v. nudus. Glandulæ sæpius parvæ, longe stipitatæ. Spicæ densæ, breves, pedunculatæ. Bracteæ caducæ. Corollæ villosæ. Legumen ubi notum dense villosum v. hirsutum.*

* *Petiolus alatus.*

105. I. FASTUOSA, *Willd. Spec.* iv. 1014. Rufo-hispida. Stipulæ latæ. Glandulæ minimæ, longe stipitatæ; foliola 4–5-juga, ovato-oblonga, acuta, supra nitida, majora semipedalia. Spicæ pedunculatæ, paucifloræ. Calyx pollicaris, pilosus. Corolla densissime sericeo-villosa, bipollicaris. Staminum tubus exsertus. Legumen dense rubiginoso villosum, ½–1-pedale, 3 poll. latum.

Mimosa fastuosa, Jacq.! Fragm. 15, t. 10.

Hab. Tropical America: Caracas.

106. I. VENOSA, *Griseb.! Fl. Brit. W. Ind.* 711 *nomen tantum.* Setoso-hispida. Glandulæ parvæ, breviter stipitatæ; foliola 3–4-juga, ovata v. ovali-elliptica, tenuiter coriacea,

nitida, majora semipedalia. Spicæ pedunculatæ, paucifloræ. Calyx 7–8 lin. longus, parce pilosus. Corolla bipollicaris, hirsutissima. Staminum tubus breviter exsertus. Legumen ignotum.

Hab. Tropical America : Trinidad, *Sieber* n. 104.

Species *I. fastuosæ* affinis. Pili ferruginei seu setæ in ramulis petiolis pedunculisque copiosi, in pagina utraque foliorum præsertim ad venas sparsi, demum evanidi. Stipulæ lanceolato-lineares, semipollicares, caducæ. Foliorum petiolus semipedalis et longior, alis latis coriaceis apice basique contractis. Foliola pennivenia, venis utrinque elevatis. Pedunculus folio brevior, supra medium florifer, floribus sessilibus dissitis. Bracteæ anguste lanceolatæ, subtus hispidæ, caducæ.

107. I. VILLOSISSIMA, *Benth.*, sp. n. Undique rufo-villosissima. Glandulæ parvæ, longiuscule stipitatæ ; foliola 3–4-juga, ovata, demum coriacea, subbullata, 3–4-pollicaria, Spicæ paucifloræ, pedunculatæ. Calyx semipollicaris, villosus. Corolla pollicaris, sericeo-villosa. Staminum tubus vix exsertus. Legumen ignotum.

Hab. Tropical America : Venezuela near Tovar, *Fendler* n. 264.

108. I. SETOSA, *G. Don ! Gen. Syst.* ii. 388. Longe setosa. Stipulæ latæ. Glandulæ parvæ, stipitatæ ; foliola 5–6-juga, oblongo-elliptica, breviter acuminata, utrinque longe pilosa, majora semipedalia. Spicæ densæ, longe pedunculatæ. Calyx striatus, pubescens, 5 lin. longus. Corollæ tubus calyce brevior, laciniæ angustæ, villosæ, dimidio longiores. Staminum tubus corolla brevior. Legumen ignotum.

Hab. Tropical America : Peru, *Pavon* (*Herb. Oxon.*).

109. I. MULTICAULIS, *Spruce !*, sp. n. Rufo-hispida. Stipulæ latæ. Glandulæ parvæ, stipitatæ ; foliola 5–6-juga, oblongo-elliptica, breviter acuminata, utrinque pilosa, majora semipedalia. Spicæ densæ, longe pedunculatæ. Calyx striatus, pubescens, 4 lin. longus. Corolla sericeo-villosa, 9–10 lin. longa. Staminum tubus breviter exsertus. Legumen ignotum.

Hab. Tropical America : Ecuador, foot of the Chimborazo, common at an elevation of 3000 feet, *Spruce*.

110. I. BLANCHETIANA, *Benth. in Mart. Fl. Bras. Mim.* Rufo-hirsutissima. Glandulæ longe stipitatæ ; foliola 3–4-juga, oblonga v. lanceolata, majora semipedalia. Spicæ laxæ, floribus pedicellatis. Calyx hirsutissimus, semipollicaris. Corolla villosissima, sesquipollicaris. Staminum tubus inclusus. Legumen ignotum.

Hab. Tropical America : Brazil, prov. Bahia, *Blanchet* n. 2632 (*Herb. DC.*).

111. I. BARBATA, *Benth. ! in Hook. Lond. Journ.* iv. 604. Rufo-pilosa. Stipulæ latæ, persistentes. Glandulæ parvæ, longe stipitatæ ; foliola 3–4-juga, ovata v. oblonga, acuminata, majora 3–5-pollicaria. Spicæ oblongæ, breviter pedunculatæ. Calyx pilosulus, 3–4 lin., corolla hirsutissima, 6–9 lin. longa. Staminum tubus inclusus. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America : Brazil, prov. Rio Janeiro and Sao Paulo.

112. I. GUILLEMINIANA, *Benth. ! in Hook. Lond. Journ.* iv. 605. Dense rufo-villosa. Stipulæ parvæ, caducæ. Foliola 2–4-juga, elliptico-oblonga, acuta, majora 3-pollicaria ; glandulæ stipitatæ, parvæ, inter villos sæpe occultæ. Spicæ ovoideo-oblongæ, peduncu-

latæ. Calyx hirsutus, $3\frac{1}{2}$ lin., corolla villosa, 6–9 lin. longa. Legumen sessile, 3–4-pollicare, ad 9 lin. latum, undique rufo-villosissimum, marginibus parum elevatis.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Rio Janeiro and Sao Paulo.

Very near *I. barbata*, but with a shorter more dense indumentum, small stipules, less stipitate glands, &c.

113. I. VULPINA, *Mart.! Herb. Fl. Bras.* n. 1097. Rufo-villosissima. Foliola 2–5-juga, ovata v. oblonga, acute acuminata, majora 3–4-pollicaria. Spicæ ovoideæ, longe pedunculatæ. Calyx pilosus, ad 4 lin. longus. Corolla dense villosa, calyce paullo v. vix dimidio longior. Legumen setoso-hirsutissimum, $\frac{3}{4}$–1 poll. latum, marginibus parum elevatis.—*Benth. in Fl. Bras. Mim.*

I. ferruginea, Planch. in Fl. des Serres, t. 773.

I. superbiens, Lem. Jard. Fleur. t. 299, 300.

Hab. Tropical America: Brazil, prov. Minas Geraes.

Differs from *I. barbata* in the small stipules, less bullate leaflets, and short corollas.

** *Petiolus nudus.*

114. I. VESTITA, *Benth.! in Hook. Lond. Journ.* iv. 604. Dense rufo-villosa. Foliola 3–4-juga, elliptico-oblonga, acuta, majora 2–$2\frac{1}{2}$-pollicaria. Spicæ ovoideæ, pedunculatæ. Calyx strigosus, ad 2 lin. longus. Corolla sericeo-villosa, 5–6 lin. longa. Staminum tubus breviter exsertus. Legumen densissime velutino-villosum, pollicem latum, marginibus parum elevatis.—*Fl. Bras. Mim.*

Hab. Tropical America: South Brazil, *Sello* (*Herb. Berol.*).

115. I. HISPIDA, *Schott!*; *Benth. in Fl. Bras. Mim.* Rubiginoso-hispida. Foliola 3–4-juga, elliptico-oblonga, 4–6-pollicaria. Spicæ breves, densæ, longe pedunculatæ. Calyx latiusculus, dense strigosus, 3 lin. longus. Corolla dense sericeo-villosa, 7–9 lin. longa. Staminum tubus inclusus. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Rio Janeiro, *Schott* (*Herb. Vindob.*).

116. I. FERRUGINEO-HIRTA, *Mart.! Benth. in Fl. Bras. Mim.* Ferrugineo-hirta. Foliola 3-juga, elliptico-oblonga, rigide coriacea, nitida, glabrescentia, majora 3–$3\frac{1}{2}$-pollicaria. Spicæ densæ, pedunculatæ. Calyx tubulosus, ferrugineo-pubescens, 4 lin. longus. Corolla dense rufo-sericea, 7–8 lin. longa. Staminum tubus inclusus. Legumen ignotum.

Hab. Tropical America: Brazil, prov. Bahia or Rio Janeiro, *Luschnath* (*Herb. Mart.*).

Although very near *I. hispida*, the specimens, on comparison, showed too much difference in the proportions of the parts and other characters to unite them without further intermediate forms.

Series 8. Dysanthæ. *Habitus et folia* Euingæ. *Petiolus alatus. Glandulæ sessiles. Spicæ laxæ. Bracteæ caducæ. Corolla et calyx pilis crispis villosissimi. Legumen ubi notum* Pseudingæ *planum, dense villosum, marginibus parum elevatis.*

It is possible that when the fruits of all the species of *Euinga* and *Pseudinga* are known, the two following may be incorporated in some of the series of the one or the other section.

117. I. DYSANTHA, *Benth. ! in Mart. Fl. Bras. Mim.* Rufo-villosa. Foliola 3–4-juga, ovali-oblonga, acuminata, marginata, villosa, majora 5-pollicaria. Spicæ laxæ. Flores sessiles. Calyx campanulatus, 3–4 lin. longus. Corolla subpollicaris. Legumen ignotum.

Hab. Tropical America: North Brazil, *Spruce*.

118. I. CAYENNENSIS, *Sagot ! Benth. in Mart. Fl. Bras. Mim.* Rufo-pubescens v. villosa. Foliola 4–5-juga, ovali- v. oblongo-elliptica, acute acuminata, 3–4-pollicaria. Spicæ laxæ, breviter pedunculatæ. Flores longiuscule pedicellati. Calyx subcampanulatus, $2\frac{1}{2}$–3 lin. longus. Corolla $\frac{3}{4}$-pollicaris. Legumen rufo-tomentosum v. villosum, 3–4-pollicare, 6–8 lin. latum, planum, crassum, marginibus parum elevatis.

Hab. Tropical America: Cayenne, *Poiteau*, *Sagot* n. 164.

The stipitate flowers and the form of the calyx and corolla are not unlike those of *I. ingoides*; but their indumentum is densely crisped, and the pod is totally different. Poiteau's specimen in Herb. Gay was given to him as the true *Mimosa ingoides* of Richard; but this has since been ascertained to have been an erroneous determination.

Species Pseudingæ *dubiæ*.

The two following species may be distinct from any of the foregoing, but are insufficiently described for identification without inspection of authentic specimens.

I. CORIACEA, *G. Don, Gen. Syst.* ii. 390. Petiolus nudus. Foliola 3–4-juga, lanceolata, acuminata, basi obliqua, margine undulata, uti petioli et ramuli novelli pilosa. Pedunculi breves, pauciflori, laterales, terminales et axillares.

Mimosa coriacea, Moç. et Sess. MS.

Hab. Mexico, *Moçino and Sessé.*

I. CARNOSA, *G. Don, Gen. Syst.* ii. 391. Petiolus nudus. Foliola 3-juga, late elliptica; mucronata, glabra. Pedunculi axillares, uti ramuli rufo-tomentosi. Legumen lanceolatum, planum.

Mimosa carnosa, Herb. Pav.

Hab. Peru, *Ruiz and Pavon.*

Sectio 5. EUINGA.

Flores quam in *Euinga* sæpe latiores, in spicas sæpius laxiusculas v. paucifloras dispositi, in rhache lineari sessiles v. breviter pedicellati. Calyx campanulatus v. tubulosus, sæpius breviter tomentosus v. puberulus, striis parum prominulis. Corolla sericeo-villosa. Legumen sæpius tomentosum, crassum, marginibus convexis dilatatis plurisulcatis, facies sæpe partem v. omnino obtegentibus, in una specie latum undique velutino-hirsutissimum. Indumentum sæpius breviter rufo-tomentellum. Foliorum petiolus, duabus speciebus exceptis, alatus. Glandulæ sessiles sæpissime adsunt. Foliola 4–6-juga, rarius 2–3-juga v. hinc inde 7-juga. Spicæ in axillis superioribus solitariæ v. geminæ, rarius ad apices ramorum subcorymbosæ. Flores plerumque semipollice longiores, pollicem haud v. vix excedentes.

The discrimination of species in this section is attended perhaps with greater difficulty than in any other Mimoseæ. The foliage and flowers often show more difference between different specimens of one species than between different species, as characterized by widely different fruits. The majority of herbarium specimens are without fruits, or, when in fruit, the matching them with flowering ones is often very uncertain. Moreover the pod frequently acquires its characteristic form only at the last stage of ripening,

in which state it is rarely gathered by collectors. The determinations, therefore, of the following species must be received with more than usual caution.

* *Petiolus nudus.*

119. I. VISMIÆFOLIA, *Pœpp., Endl.! Nov. Gen. et Sp.* iii. 79. Villoso-hirta. Foliola 3-juga, late ovata, obtusa, supra glabra, subtus villosa, $\frac{1}{2}$–1-pedalia. Spicæ magnæ, globosæ, longe pedunculatæ, ad apices ramorum longe racemosæ. Calyx 5 lin., corolla 7–8 lin. longa. Stamina numerosissima, tubo vix exserto. Legumen ignotum.

Hab. Tropical America: Eastern Peru, prov. Maynas, *Pœppig*.

120. I. RUBIGINOSA, *DC.! Prod.* ii. 434. Ferrugineo-velutina. Foliola 4–5-juga, ovata v. elliptico-oblonga, acuminata, nitida, subtus velutina, majora 6–8-pollicaria. Spicæ breviter pedunculatæ, interrupte paucifloræ. Flores sessiles. Calyx campanulatus, rufo-velutinus, 3 lin. longus. Corolla pilis crispis villosissima, subpollicaris. Legumen ignotum.

Mimosa rubiginosa, Rich.! in Act. Soc. Hist. Nat. Par. 1792, 113.

Hab. Tropical America: Cayenne, *Martin*; Demerara, *Parker*.

** *Petiolus alatus.*

121. I. VERA, *Willd. Spec.* iv. 1010. Ferrugineo-tomentella v. pubescens. Foliola 4–6-juga, obovali- v. elliptico-oblonga, majora 4–5-pollicaria. Spicæ paucifloræ v. demum interruptæ. Flores sessiles v. brevissime pedicellati. Bracteæ parvæ, ovatæ. Calyx tubulosus, tomentellus, 6–7 lin. longus. Corolla villosa, vix dimidio longior. Legumen subsemipedale (v. longius?), ad $\frac{3}{4}$ poll. latum, marginibus valde dilatatis plurisulcis et undulatis, faciebus tamen apertis.—*Benth. in Fl. Bras. Mim.*

Mimosa Inga, Linn. Spec. 1498, ad ic. Sloane, Jam. t. 183. f. 1, et Plum. Ic. t. 25.

Inga Berteriana, DC. Mém. Lég. 438; Prod. ii. 434.

Inga pauciflora, Walp. et Duchass. in Linnæa, xxiii. 746.

Inga Mociniana, G. Don! Gen. Syst. ii. 388.

Hab. Tropical America: West Indies, Central America, Columbia, and perhaps Guiana, but often planted.

The typical Jamaica form appears to me to be precisely represented also by Bertero's specimens from Santa Marta. The Central-American and South-Mexican specimens, including the above-quoted synonyms of Walpers and Don, appear, in the proportions of the flowers, to pass into *I. xalapensis* and *I. spuria,* whilst the Columbian ones often approach those of *I. affinis* and *I. uraguensis* as well as *I. spuria*; and perfect fruits are altogether wanting; so that the limits of the species cannot at present be determined on.

I. comewynensis, Miq. Stirp. Surin. 1, from Surinam, *Focke,* from the character given, can scarcely differ from the true *I. vera*; *I. Benthamiana,* Meissn. in Linnæa, xxi. 253, from Surinam, *Kegel,* n. 1206, of which the fruit is also unknown, is most probably likewise to be included amongst the varieties of *I. vera.*

I. lamprophylla, C. Wright and others, of the San-Domingo U.S. Commission of Inquiry, may be also a variety of *I. vera* with more glabrous shining leaflets and very shortly pedicellate flowers approaching those of *I. spuria.*

122. I. URAGUENSIS, *Hook. et Arn.! in Hook. Bot. Mim.* iii. 202. Ferrugineo-tomen-

tella. Foliola 4–6-juga, oblonga, majora 3–4-pollicaria. Spicæ breves, densæ v. parum elongatæ. Flores sessiles. Bracteæ parvæ, ovatæ. Calyx tubulosus, tomentellus, ad 5 lin. longus. Corolla villosa, parum v. vix dimidio longior. Legumen *I. veræ* v. brevius, marginibus sæpius latioribus, faciebus angustius apertis.—*Benth. in Fl. Bras. Mim.*

Hab. Tropical and subtropical South America: Brazil, prov. Sao Paulo, and perhaps Rio Janeiro, and on the Uruguay.

Very near *I. vera*, this appears to be its southern representative, differing slightly in foliage and inflorescence, in smaller flowers, and perhaps in the pod.

123. I. XALAPENSIS, *Benth.! in Hook. Lond. Journ.* iv. 616. Ferrugineo-pubescens v. villosa. Foliola ad 5-juga, obovali- v. elliptico-oblonga, majora 4-pollicaria. Spicæ oblongæ, laxiusculæ v. interrupte pauciforæ. Flores sessiles v. brevissime pedicellati. Bracteæ lanceolatæ, subpersistentes. Calyx tubuloso-campanulatus, $4\frac{1}{2}$–5 lin. longus; corolla villosa, dimidio longior. Legumen ignotum.

Hab. Tropical America: Mexico, *Coulter*, *Linden* n. 671, *Jurgensen* n. 595.

I. eriocarpa, Benth.! in Hook. Lond. Journ. iv. 615, from South Mexico, *Coulter*, *Berlandier* (*Herb. DC.*), may be the same species. The pod in these specimens is narrower and longer than in *I. vera*, with the margins more closed over the faces.

I. flexuosa, Schlecht, Linnæa, xii. 559 (*I. Schiedeana*, Steud. Nom. Bot. ed. 2), of which the flowers are not described, may be the same species.

124. I. SPURIA, *Humb. et Bonpl. in Willd. Spec.* iv. 1011. Ferrugineo-pubescens, Foliola 5–6-juga, oblongo-elliptica, acuta, majora 4–5-pollicaria. Spicæ laxæ. Flores breviter pedicellati. Bracteæ parvæ, ovatæ. Calyx latiuscule tubulosus, tomentoso-villosus, 5–6 lin. longus; corolla parum v. vix dimidio longior. Legumen *I. veræ*.—*Kunth, Mim.* 39. t. 12; *Benth. in Fl. Bras. Mim.*

Mimosa spuria, Poir. Dict. Suppl. i. 40.

Hab. Tropical America: Columbia and apparently also in Brazil, prov. Bahia and Rio Janeiro.

This differs from *I. vera* in the flowers stipitate, sometimes almost as much as in *I. ingoides*; but in this respect, as in some others, the specimens we have of the four preceding species show numerous slight variations; and possibly, when better known, all may prove to be varieties of one widely spread and variable species. Besides the specimen figured as *I. spuria*, Kunth's collection in the herbarium of Paris contains a specimen apparently of *I. edulis*, with sessile calyces, under the same name of *I. spuria*.

125. I. FEUILLEI, *DC. Prod.* ii. 433. Pubescens. Foliola 4–5-juga, ovali-oblonga, utrinque acuta, glabrescentia, majora 4–6-pollicaria. Spicæ longæ, rhache demum $1\frac{1}{2}$–2-pollicari. Flores sessiles, subdissiti. Bracteæ lineares, calyce breviores, subpersistentes. Calyx tubulosus, tomentosus, 4–5 lin. longus. Corolla rufo-sericea, 8–9 lin. longa. Legumen "1–2-pedale," ex icone planum, marginibus dilatatis.

Inga reticulata, Spreng. Syst. iii. 130.

I. Cumingiana, Benth. in Hook. Lond. Journ. iv. 616.

Hab. Tropical America: Lima in Peru, where it is much planted in gardens, *Feuillée*; Lima, *Cuming* n. 980; temperate valleys of the Andes, *Jameson*.

This species, readily known by its inflorescence and bracts, was established both by De Candolle and by Sprengel upon Feuillée's figure and description of *Pacai*, Obs. iii. pars ii. 27, t. 19. Aublet, Pl. Gui.

ii. 945, quotes the same figure for his *Mimosa sinemariensis*, without any further characters to enable us to conjecture what Cayenne plant he had mistaken for Feuillée's. G. Don, Gen. Syst. ii. 388, under the name of *Inga sinemariensis*, seems to have mixed up with the Peruvian plant the *I. laurina*, Sw. *Mimosa Pacai*, "Fres. in Vitm." inserted in Steud. Nom. Bot. ed. 2, is probably founded also on Feuillée's plant.

126. I. INSIGNIS, *Kunth! Mim.* 43, t. 13. Ferrugineo-hirta v. tomentosa. Foliola 4–5-juga, ovali- v. oblongo-elliptica, acuminata, coriacea, hirta v. glabrata. Spicæ ovoideo-oblongæ, densæ, pedunculatæ. Flores sessiles. Bracteæ oblongæ v. lanceolatæ, caducissimæ. Calyx tubulosus, pilis crispis villosus, ad 5 lin. longus. Corolla villosissima, pollice brevior. Legumen crassum, durum, marginibus latis subæqualiter tetragonum, semipedale, pollicem latum et crassum.—*Benth. Fl. Bras. Mim.*

I. pachycarpa, Benth.! in Hook. Lond. Journ. iv. 617.

Hab. Tropical America: common in the Andes of Quito, *Humboldt and Bonpland*, *Hartweg* n. 966, *Spruce* n. 5096; and apparently the same species, but not in fruit, Brazil, prov. Minas Geraes, *Burchell* n. 5835.

127. I. AFFINIS, *DC. Prod.* ii. 433. Rufo-velutina v. pubescens. Foliola 4–6-juga, ovali- v. oblongo-elliptica, acuminata v. obtusa, majora 3–6-pollicaria. Spicæ breves v. demum longiusculæ. Flores sessiles. Bracteæ parvæ, ovatæ. Calyx tomentosus, latiusculus, 3–4 lin. longus. Corolla sericeo-villosa, 7–8 lin. longa. Legumen tomentosum, fere *I. veræ*, marginibus latis sulcatis, faciebus apertis.—*Benth. in Fl. Bras. Mim.*

Mimosa dulcis, Vell. Fl. Flum. Ic. xi. t. 4.

Inga dulcis, Mart. Herb. Fl. Bras. 113, non Willd.

Inga Arrabidæ, Steud. Nom. Bot. ed. 2.

I. acutifolia, Benth.! in Hook. Lond. Journ. iv. 614.

Hab. Tropical America: Brazil, prov. Rio Janeiro, Minas Geraes, Mattogrosso, Goyaz, Pernambuco and Para, and perhaps also in Bolivia and the Argentine Republic.

Closely allied to *I. vera*; this appears to differ chiefly in the corolla, at least twice as long as the calyx, and perhaps also in some measure in the pod; but in neither species have I been able to ascertain the normal form, the fruits attached to dried specimens being usually unripe or defective.

Inga ornifolia, H., B. et K., Nov. Gen. et Sp. vi. 291, from Quito, only known in fruit, is probably not different from *I. affinis*.

Inga rhoifolia, Willd. Enum. Hort. Berol. 1046, from Para, *Hoffmansegg*, only known in leaf, without flowers or fruit, resembles in that state rather *I. affinis* than any of its allies.

Mimosa umbellata, Vell. Fl. Flum. Ic. xi. t. 12, or *Inga Vellosiana*, Mart. Fl. Bras. 114 (non ejusd. ibid. 118), from the rude figure, may be referrible to a variety of *I. affinis*, although the bracts are represented as linear.

128. I. MEISSNERIANA, *Miq.! Stirp. Surin.* 2. Rubiginoso-tomentosa. Foliola 4–6-juga, oblongo-elliptica v. sublanceolata, acuminata, quam in *I. affini* angustiora, pleraque 3–4-pollicaria. Spicæ breviter pedunculatæ, sæpius fasciculatæ, 1–2-pollicares. Flores subsessiles, quam in præcedentibus tenuiores. Calyx tomentosus, 3–4 lin. longus. Corolla sericeo-villosa, ad 9 lin. longa. Legumen ignotum.

Hab. Tropical America: Surinam, *Focke*; Cayenne, *Sagot* n. 926.

129. I. SCABRIUSCULA, *Benth.! in Hook. Lond. Journ.* iv. 606. Tenuiter ferrugineo-puberula. Foliola 4–5-juga, ovali- v. obovali-elliptica, breviter acuminata, vix coriacea, majora 5-pollicaria. Spicæ breviter pedunculatæ, laxiusculæ, superiores subcorymbosæ.

Flores sessiles, angusti. Calyx puberulus, 3–3½ lin. longus. Corolla sericeo-villosa, 6–8 lin. longa. Legumen (perfectum ?) semipedale, ½ poll. latum, marginibus quam in *I. vera* minus dilatatis, faciebus late apertis.—*Fl. Bras. Mim.*

I. uncinata, Spruce, Pl. Exs.

Hab. Tropical America: North Brazil, Guiana, and Columbia.

With the narrow flowers nearly of *I. edulis*, this has a pod nearer to that of *I. vera*, to which latter species it appears to have been referred in some herbaria.

130. I. EDULIS, *Mart.! Herb. Fl. Bras.* 113. Ferrugineo-tomentosa. Glandulæ magnæ, sæpe compressæ transversæque. Foliola 4–6-juga, ovali- v. oblongo-elliptica, acuminata, submembranacea, majora 6–8-pollicaria. Spicæ breviter pedunculatæ, subcorymbosæ. Flores sessiles, angusti. Calyx molliter tomentosus, 2½–4 lin. longus. Corolla sericeo-villosa, 7–9 lin. longa. Legumen ultrapedale, subteres, marginibus valde dilatatis plurisulcatis supra facies clausis.—*Benth. in Fl. Bras. Mim.*

I. vera, H., B. et K.! Nov. Gen. et Sp. vi. 289, non Willd.

Mimosa Ynga, Vell. Fl. Flum. Ic. xi. t. 3.

Hab. Tropical America: North Brazil, Guiana, Columbia, Peru and Central America; sent also from Minas Geraes and Rio Janeiro, but perhaps not indigenous, as it is frequently cultivated.

With the fruit of *I. ingoides*, this has the very different inflorescence and flowers of *I. scabriuscula*, and the foliage rather distinct from both.

131. I. FASCICULATA, *Pœpp. et Endl. Nov. Gen. et Sp.* iii. 79. Ferrugineo-velutina. Foliola 4-juga, ovali- v. elliptico-oblonga, quam in *I. eduli* magis coriacea. Inflorescentia *I. edulis*, flores minores, corolla ad 5 lin. longa. Legumen 6–8 poll. longum, 1 poll. latum, junius tenuiter villosum, demum glabrum.

Hab. Tropical America: Eastern Peru near Cuchero, *Pœppig.*

I have not now seen this species, which requires further comparison with some others of the section.

132. I. ŒRSTEDIANA, *Benth.! in Seem. Bot. Her.* 117. Dense rubiginoso-pubescens. Glandulæ parvæ v. obsoletæ; foliola 4-juga, oblongo- v. ovali-elliptica, obtusiuscula, majora 6–8-pollicaria. Spicæ oblongæ, breviter pedunculatæ, superiores corymbosæ. Flores sessiles, angusti. Calyx velutinus, 3 lin. longus. Corolla rufo-villosissima, 6–7 lin. longa. Legumen *I. edulis*, elongatum, subteres, sulcatum.

I. clavigera, Moritz, in Herb. Sond.

Hab. Tropical America: Costa Rica, *Œrsted*; Panama, *Seemann*; Columbia, *Moritz.*

133. I. CONFERTA, *Benth.! in Hook. Lond. Journ.* iv. 620. Tenuiter puberula. Glandulæ magnæ; foliola 5–6-juga, ovali-elliptica v. oblonga, acuminata, pleraque semipedalia. Spicæ oblongæ, pedunculatæ, fasciculatæ, superiores numerosæ denseque corymbosæ. Flores sessiles. Calyx tomentosus, 3 lin. longus. Corolla sericeo-villosa, 6–7 lin. longa. Legumen ignotum.

Hab. Tropical America: Eastern Peru, Tarapoto, *Mathews* n. 1595.

134. I. FENDLERIANA, *Benth.*, sp. n. Rufo-tomentosa. Glandulæ parvulæ. Foliola sub-4-juga, ovata v. elliptica, obtusa, supra nitida, subtus pubescentia, 4–6-pollicaria. Spicæ densæ, numerosæ, in corymbum densissime confertæ. Flores sessiles. Calyx rubiginoso-tomentosus, 3 lin., corolla rufo-sericea, 6–7 lin. longa. Legumen oblongum,

crassissimum, dense rubiginoso-velutinum, 2–2½-pollicare, pollicem latum, marginibus latis, faciebus apertis.

Hab. Tropical America: Columbia, valley of Macarao, *Fendler* n. 2259.

135. I. LUSCHNATHIANA, *Benth.! in Hook. Lond. Journ.* iv. 618. Ferrugineo-tomentosa v. pubescens. Foliola 4–5-juga, ovali-oblonga, obtusa v. acuminata, majora 3–4-pollicaria. Spicæ longæ, breviter pedunculatæ, axillares. Flores subsessiles. Calyx latiusculus, 1½–2 lin. longus. Corolla sericeo-villosa, 7–8 lin. longa. Legumen (si huc rite relatum) crassum, latiusculum, tomentosum, marginibus plurisulcatis latissimis facies omnino obtegentibus.—*Fl. Bras. Mim.*

I. eriantha, Benth.! in Hook. Lond. Journ. iv. 614.

Hab. Tropical America: Brazil, prov. Rio. Janeiro and Minas Geraes.

I am not confident of having correctly matched the fruiting specimens with the flowering ones, which are distinguished from *I. affinis* and its allies chiefly by the proportions of the flowers.

136. I. SUBNUDA, *Salzm.! Benth.! in Hook. Lond. Journ.* iv. 613. Ferrugineo-pubescens. Petiolus breviter et anguste alatus. Foliola 2–3-juga, ovali- v. oblongo-elliptica, acuminata, majora semipedalia. Spicæ breviter pedunculatæ, superiores breviter subpaniculatæ. Flores pedicellati. Calyx campanulatus, velutinus, fere 3 lin. longus. Corolla dense villosa, 7–8 lin. longa. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia.

The flowers are nearly those of *I. Luschnathiana,* but pedicellate; and the foliage is very different.

137. I. LAXIFLORA, *Benth.! in Hook. Lond. Journ.* iv. 617. Rufo-velutina. Foliola 5-juga, oblongo-elliptica, acuminata, hirtella, demum nitida, majora 5-pollicaria. Pedunculi elongati, interrupte floriferi. Flores pedicellati. Calyx latiusculus, velutinus, 4 lin. longus. Corolla villosissima, ad 9 lin. longa. Legumen ignotum.

Hab. Tropical America: Peru, Sesuya, *Mathews* n. 3274.

The long loose inflorescence readily distinguishes this from *I. ingoides.*

138. I. INGOIDES, *Willd. Spec.* iv. 1012. Ferrugineo-tomentella. Foliola 4–5-juga, ovali- v. oblongo-elliptica, mucronata v. acuminata; majora 4–6-pollicaria. Spicæ breves, laxæ, superiores subcorymbosæ. Flores pedicellati. Calyx latiusculus, tomentosus, 3–3½ lin. longus. Corolla sericeo-villosa, 6–7 lin. longa. Legumen uni- v. pluripedalis, subteres, marginibus valde dilatatis plurisulcatis supra facies clausis.—*Benth. in Fl. Bras. Mim.*

Mimosa ingoides, Rich. in Act. Soc. Nat. Par. 1792, 113.

Inga ornata, Kunth! Mim. 46, t. 14.

I. Merianæ, Splitg.! Pl. Nov. Surin. 19.

I. galibica, Walp. et Duchass.! in Linnæa, xxiii. 747.

Hab. Tropical America: Guiana, West Indies, and Columbia, and probably also North Brazil.

In foliage and flowers this approaches *I. affinis* and *I. spuria*; but the pedicels are usually longer, and the legume, well figured by Meriana, is that of *I. edulis.* Without the pod it is readily confounded with several other species; and amongst the specimens referred by Triana to *M. ornata,* there are some with larger flowers, or a rather different inflorescence, which may belong to some distinct species, but impossible to define without the fruit.

139. I. BAHIENSIS, *Benth. ! in Hook. Lond. Journ.* iv. 618. Folia flores et inflorescentia *I. ingoides*, nisi spicæ magis corymbosæ, et corolla ratione calycis sublongior. Legumen *I. affinis*, semipedale, 8–9 lin. latum, marginibus valde dilatatis, facies tamen non obtegentibus.—*Fl. Bras. Mim.*

Hab. Tropical America: Brazil, prov. Bahia, and, if rightly determined, also Rio Janeiro, Minas Geraes, and Goyaz; but the specific characters require further investigation.

140. I. SESSILIS, *Mart. ! Herb. Fl. Bras.* 114. Rufo-velutina. Foliola 5–7-juga, oblonga v. ovali-lanceolata, acuminata, majora 3–5-pollicaria. Spicæ axillares, interrupte paucifloræ. Flores sessiles. Calyx crassus, ovoideo-campanulatus v. inflatus, 7–14 lin. longus. Corolla villosissima, calyce parum v. dimidio longior. Legumen rufo-hirsutissimum, crassum, semipedale, 1–1½ poll. latum, rectum v. arcuatum, margine exteriore irregulariter incrassato.—*Fl. Bras. Mim.*

Mimosa sessilis, Vell. Fl. Flum. Ic. xi. t. 21.

Inga calycina, Benth. ! in Hook. Lond. Journ. iv. 612.

Hab. Tropical America: Brazil, prov. Rio Janeiro and Minas Geraes.

The calyx, although very variable in size, is always large, nearly of the shape of that of *Affonsea*, but thicker. The pod is a very distinct one.

XXIX. AFFONSEA, St.-Hil.

Benth. et Hook. Gen. Pl. i. 599.

The genus is confined to Southern tropical Brazil.

1. A. DENSIFLORA, *Benth. ! in Hook. Lond. Journ.* v. 76. Petiolus nudus. Foliola 3–4-juga, oblonga, acuminata, nitida, plana, glabra, majora 5–6-pollicaria. Bracteæ cum floribus in spica brevi densa imbricatæ. Calyx 8 lin. longus. Corolla pollicaris. Legumen ignotum.—*Fl. Bras. Mim.*

Hab. Brazil, prov. Bahia.

2. A. JUGLANDIFOLIA, *St.-Hil. ! Voy. Diam.* i. 385. Petiolus interrupte alatus. Foliola 2–4-juga, ovali- v. elliptico-oblonga, vix acuminata, tenuiter coriacea, nitidula, plana, majora 4–6-pollicaria. Spica laxa, bracteis patentibus caducisve. Calyx 9–10 lin. longus. Corolla paullo longior. Legumen ignotum.—*Benth. ! in Fl. Bras. Mim.*

A. comosa, Benth. ! in Hook. Lond. Journ. v. 76, t. 1.

Hab. Brazil, prov. Rio Janeiro and Bahia.

3. A. BULLATA, *Benth. ! in Hook. Lond. Journ.* v. 77. Petiolus alatus. Foliola 3–5-juga, longe oblongo-lanceolata, bullato-rugosa, majora 6–9-pollicaria. Bracteæ cum floribus in spica densa imbricatæ. Calyx 5–6 lin. longus. Corolla paullo longior. Legumen crassum, compressum, ferrugineo-villosum, 3–4 poll. longum, 9–10 lin. latum.—*Fl. Bras. Mim.*

Hab. Brazil, prov. Rio Janeiro.

Species dubiæ.

Species which may be distinct from any of the foregoing, yet so imperfectly described that I am unable to fix upon the genera to which they should be ascribed :—

Mimosa flava, Forsk. Fl. Æg. Arab. 176. Pinnæ 3–5-jugæ. Foliola 7–10-juga, linearia, semiunguem longa, obtusa. Glandula nulla. Flores pallide flavi.

Hab. Surdud in Arabia, *Forskål.*

Schweinfurth thinks that this comes nearest to *Acacia Verek*, above referred to *A. Senegal*; but that species has the petiolar glands very prominent.

Mimosa glomerata, Forsk. Fl. Æg. Arab. 177. Folia bipinnata. Legumen nigrum contorto-globosum.

Hab. Arabia, included in the Fl. Arab. p. cxxiii, but no further clue given to its station or character.

Mimosa Sejal, Forsk. Fl. Æg. Arab. 177 (*Acacia hadiensis*, DC. Prod. ii. 472). Inermis. Pinnæ 3-jugæ, inferiores squama una, extimæ squama duplici distinctæ. Foliola 14-juga, ovali-linearia, ungue breviora.

Hab. Hadie in Arabia, *Forskål.*

I know of no Mimoseæ with scales on the petioles between the pinnæ except some Brazilian species of *Mimosa* itself.

Mimosa stellata, Forsk. Fl. Æg. Arab. 177; Vahl, Symb. i. 81 (*Acacia stellata*, Willd. Spec. iv. 1079). Spinæ stipulares (aculei?) recurvæ. Pinnæ 10-jugæ. Foliola 13-juga, oblonga. Petiolus communis subtus aculeis geminis oppositis recurvis, ad singula paria et supra intra foliola singulorum aculeus erectus. Pedunculus axillaris, superne villosus. Flores in racemo composito numerosi, patentes, sparsi, pedicellis longitudine florum. Sepala 5, ovata, acuta. Petala 5, lanceolata. Stamina 10, distincta, corolla parum longiora. Legumen compressum, membranaceum, lanceolatum.

Hab. Mount Kurma in Arabia, *Forskål.*

Some of the characters would point to a *Mimosa* allied to *M. rubicaulis*; but many others are at variance with any Mimoseous genus known to me.

Mimosa pilosa, Lour. Fl. Cochinch. 650 (*M. crinita*, Pers. Syn. ii. 261). Inermis, pilosa. Folia simpliciter pinnata. Foliola multijuga, ovata, obtusa, utrinque pilosa, superiora minora. Flos terminalis, conglobatus in capitulum magnum albissimum. Calyx 5-fidus, erectus. Corolla campanulata, 5-fida. Filamenta numerosa, corolla duplo longiora. Antheræ minimæ. Stylus filiformis. Legumen lineare, tenue, rectum, polyspermum.

Hab. Cochinchina, *Loureiro.*

The flowers and fruit described might be those of an *Albizzia*; but I know of no Old-World Mimosea with simply pinnate leaves, nor with the peculiar inflorescence described.

Mimosa glandulosa, Vahl, Ecl. iii. 38 (*Inga glandulosa*, Steud.; DC. Prod. ii. 442). Glabra, inermis. Pinnæ 5–8-jugæ. Foliola 17-juga (these numbers reversed by DC.), linearia, semiunguicularia, acuta, latere altero angustissima, glabra. Glandulæ sessiles, cavæ. Spicæ axillares, solitariæ, folio longiores, erectæ. Flores parvi. Stamina numerosa, monadelpha.

Hab. Cayenne, *v. Rohr.*

Probably an *Acacia*, closely allied to *A. nudiflora* and *A. scleroxyla*. The only plants named *M. glandulosa* which I found in Vahl's herbarium, were very different East-Indian species.

Mimosa leptophylla, Cav. Hort. Matrit. ex Lag. (*Inga leptophylla*, Lag. Elench. Hort. Matr. Nov. Gen. et Sp. 16). Spinæ stipulares recurvæ. Pinnæ 4-7-jugæ. Foliola 10–18-juga. Capitula globosa, pedunculata. Stamina sub 40, monadelpha. Legumen lanceolatnm, subfalcatum.

Hab. Raised in the Madrid Garden from American seeds sent by Née.

Recurved stipular spines or infrastipular prickles are so rare in American polyandrous Mimoseæ, that

I am unable to suggest the affinities of this species; possibly an *Acacia* allied to *A. Rœmeriana*, or a *Pithecolobium* (*Ortholobium*), or *Calliandra* allied to *C. chilensis*.

Mimosa strigosa, Pers. Syn. ii. 263, non Willd. (*Acacia strigosa*, Spreng. Syst. ii. 137 non Link; *A. strigulosa*, Steud. Nom. Bot. ed. 2). Pinnæ unijugæ. Foliola bijuga, obliqua, subtus pilosa. Flores capitati. Legumen compressum, strigosum.

Hab. Peru, *Herb. Juss.*

The above character is insufficient to determine the genus of this species; it cannot, however, be a true *Mimosa* of the *Sensitivæ* series, as both pairs of leaflets of each pinna are perfect.

Mimosa arcuata, Mart. et Gal. in Bull. Acad. Brux. x. ii. 308. Glabra. Spicæ geminæ, validæ. Pinnæ 2–3-jugæ. Foliola 10–15-juga, oblonga, minuta. Pedunculi axillares, folio longiores. Capitula globosa. Legumen arcuatum, lineari-elongatum, multiarticulatum, læve.

Hab. Mexico, calcarcous mountains east of Tehuacan de las Granadas, alt. 6000 ft., *Galeotti* n. 3222.

The stamens are not described; the flowers in the Latin character are said to be white, in the French notes yellow. I have been unable to match the above characters with any of the Mexican specimens I have seen.

Mimosa geminata, DC. Prod. ii. 427. Caules diffusi petiolique aculeati. Pinnæ 2-jugæ (jugis distantibus). Foliola 15–20-juga. Capitula axillaria, gemina, fere *M. pudicæ*.

Hab. Mexico, *Moçino and Sessé.*

Described from a very rude drawing of Moçino and Sessé's; the fruit unknown, and the stamens not mentioned. Being placed in the division "pinnis distantibus," it cannot be referred to any form of *M. pudica*, and it may prove to be some species allied to *M. fragrans*.

Mimosa monadelpha, Roxb. Fl. Ind. ii. 544. Pinnæ subbijugæ. Foliola subbijuga, oblique oblonga, glabra. Panicula terminalis. Stamina numerosa, in tubum longissimum connata. Legumen stipitatum, 1–2-spermum.

Hab. None given.

Mimosa Carisquis, Blanco, Fl. Filip. 734, ed. 2. 507, from the Philippine Islands, may possibly be allied to *Albizzia Julibrissin* (*Acacia Nemu*), with which the author compares it; but the flowers are not described.

Mimosa longisiliqua, Vell. Fl. Flum. Ic. xi. t. 15, is probably some *Piptadenia*, although I cannot match the rude representation of a fruiting specimen with any species of which the pod is known to me.

Hab. Brazil.

Acacia nutans, Spreng. Syst. iii. 141. Inermis, glabra. Petiolus eglandulosus. Pinnæ 12-jugæ. Foliola multijuga, linearia, obtusiuscula. Capitula racemosa, nutantia. Legumen lineare.

Hab. New Granada, on the Magdalena, *Bertero.*

I know of no Mimoseæ with the inflorescence described by Sprengel. The specimen named by him *A. nutans*, which I saw in Herb. Balb., was *Mimosa leiocarpa*, DC., with erect spikes.

Acacia pubescens, Schlecht. Linnæa, xii. 565. Pubescens. Aculei stipulares gemini, recti v. curvuli, basi subconnati. Pinnæ 4–5-jugæ. Foliola 12–14-juga, anguste elliptica, 2 lineis breviora. Petiolus uniglandulosus. Legumen ultra 4 poll. longum, 7–8 lin. latum, falcatum, externe subarticulatum, inter semina hinc inde contractum. Semina septis nullis distincta.

Hab. Mexico: Regla, *Ehrenberg.*

I should have considered this plant an *Acacia* closely allied to, if not identical with, *A. tortuosa*, but for the carpological character, which points rather to some *Pithecolobium*.

Acacia pauciflora, A. Rich. Fl. Cub. i. 461 (*Calliandra pauciflora*, Griseb. Cat. Pl. Cub. 284). Nana, pubescens. Aculei gemini, stipulares, recurvi, breves. Folia minima. Pinnæ 1-jugæ. Foliola sub-4-juga, oblonga, obtusissima, coriacea, ciliata, pilosiuscula. Capitula solitaria, axillaria, pedunculata,

2–3-flora. Calycis tubulosi laciniæ lanceolatæ, acutæ. Corollæ lobi acuti, ciliati. Stamina 12, libera. Legumen ignotum.

Hab. Cuba, *R. de la Sagra.*

Probably a *Pithecolobium* (*Ortholobium*), differing from *P. prehensile* in the foliage, which is that of *Calliandra colletioides*, and in the pedunculate flower-heads. The stipular spines, when present, are always straight and acicular in *Calliandra*, recurved in *Ortholobium*. A. Richard describes the stamens as free whenever the staminal tube does not exceed the corolla so as to be visible without dissecting.

Acacia insularis, A. Rich. Fl. Cub. i. 464. Inermis, villosa. Stipulæ membranaceæ, foliaceæ, oblongæ, acutissimæ, pilosæ. Pinnæ sæpius 3-jugæ. Foliola 24–35-juga, minima, oblongo-elliptica, obtusa, subpilosa, ciliata, subtus 3-nervia. Capitula ovoidea, solitaria, axillaria, longe pedunculata. Calyx 5-fidus. Corolla 5-fida, calyce duplo longior. Stamina 10, libera. Ovarium apice penicillatim villosum. Legumen ignotum.

Hab. Cuba, *A. de la Sagra.*

Certainly no *Acacia* if the stamens are correctly described. Possibly some *Neptunia*, but does not agree with any specimen known to me.

Acacia littoralis, A. Rich. Fl. Cub. i. 467. Inermis, tomentoso-pubescens. Stipulæ vix conspicuæ. Petiolus eglandulosus. Pinnæ 2–8-jugæ. Foliola 30–40-juga, oblongo-angusta, obtusa, subcoriacea, nitida, subtus pallidiora. Capitula parvula, sphærica, pedunculata, in racemum terminalem laxum ramosum disposita. Calyx turbinatus, obsolete 5-dentatus, apice villosus. Corolla calyce triplo longior, glabriuscula. Stamina circiter 20–25, libera. Legumen ignotum.

Hab. Cuba, Vuelto de Abajo, *Valenzuela*, "Moruro da Costa" of the natives.

Grisebach refers this to *Calliandra portoricensis*; but the inflorescence described and some other characters are quite at variance with that species.

Albizzia (*Serianthes*) *amœnissima*, F. Muell. Fragm. viii. 165, from the N.E. extremity of New South Wales, would appear, from the characters given, to be intermediate as it were between *Serianthes grandiflora* and *S. myriadena*, which F. Mueller unites under the name of *Albizzia grandiflora*. The pod, however, is unknown, and the genus must be in some measure uncertain.

Inga Berterii, Spreng. Syst. iii. 127 (*I. Sprengelii*, G. Don, Gen. Syst. ii. 392). Spicæ stipulares, geminæ, rectæ. Pinnæ 1-jugæ. Foliola 1-juga, oblique oblonga, obtusa, coriacea, glabra. Flores racemosi. Legumen glabrum, rectiusculum.

Hab. South America, *Bertero.*

I found no specimen with this name amongst Bertero's plants named by Sprengel in Herb. Balbis, nor any to which the above character might be applicable, except, perhaps, the *Pithecolobium hymenæfolium*, of which there was a specimen of Bertero's from the Rio Magdalena; that, however, has the pod much curved.

Inga alternifolia, G. Don, Gen. Syst. ii. 395 (*Mimosa circinalis*, Moç. et Sess. MS.), glabra. Pinnæ multijugæ; foliola multijuga, alterna, glauca, coriacea. Spinæ stipulares rectæ. Pedunculi axillares, solitarii. Capitula globosa. Legumen glabrum, cochleato-contortum.

Hab. Mexico.

It is doubtful from the character given whether this is a *Pithecolobium* or a *Prosopis*.

Species exclusæ.

The following, although some of them imperfectly known, are all either referrible to the Suborder Cæsalpinieæ, or are not Leguminous plants at all.

Mimosa nodosa, Linn. Spec. 1498 (*Inga nodosa*, Willd. Spec. iv. 1016), = *Cassia bacillaris*, Linn.

Mimosa balsamica, Mol. Hist. Chil., = *Larrea nitida*, Cav. ex C. Gay, Fl. Chil. ii. 181.

Mimosa fera, Lour. Fl. Cochinch. 652, = *Gleditschiæ* sp. ex char.

Mimosa stellata, Lour. Fl. Cochinch. 651 (*Acacia taxifolia*, Willd. Spec. iv. 1050; *Mimosa taxifolia*, Poir. Dict. Suppl. i. 59; *Mimosa ternata*, Pers. Syn. 261), and *M. sinuata*, Lour. l. c. 653, from Cochinchina, are evidently, from Loureiro's descriptions, not Leguminous plants; but I am unable to guess at their real affinities.

Mimosa bauhiniæfolia, Salisb. Prod. 324, is probably a true *Bauhinia*.

Mimosa Kantuffa, DC. Prod. ii. 431, = *Pterolobium lacerans*, Br.

Mimosa crocea, *M. laxa*, *M. Musa*, *M. Pacoba*, *M. pulchra*, and *M. triphylla*, Vell. Fl. Flum. Ic. xi., are all species of *Swartzia*.

Adenanthera triphysa, Dennst. Schluss. Hort. Malab. 15, = *Ailantus malabaricus*, DC.

Acacia dolabriformis, Wendl. Comm. Acac. 55, = *Daviesia incrassata*, Sw.

Acacia Bancroftiana, DC. Prod. ii. 473, = *Cæsalpinia bijuga*, Sw.

Inga byrsinocarpa, Hochst. in Schimp. Pl. exs., = *Millettia ferruginea*, Baker.

Inga pterocarpa, DC. Prod. ii. 441, = *Peltophorum ferrugineum*, Benth.

Inga unijuga, Pœpp. et Endl. Nov. Gen. et Sp. iii. 79, = *Macrolobium limbatum*, Spruce.

Nomina delenda.

Supposed species, either resulting from the confusion of synonyms, or undescribed, or so described as not to be henceforth identified, although all with very little doubt founded on species already described under other names.

A. *Compound species.*

Mimosa vaga, Linn. Spec. 1503 (*Acacia vaga*, Willd. Spec. iv. 1063), was originally characterized in Hort. Cliff. 209, from *Albizzia Lebbek*, to which was added the Brazilian *Guaibi-pocaca-biba*, which, from Piso's rude figure, copied by Marcgrave, comes nearest to *Pithecolobium Saman*. This, however, is scarcely Brazilian; and Breynius's plate 15, quoted more doubtfully by Linnæus, is evidently *Pithecolobium Auaremotemo*.

Mimosa Ouyrarema, Aubl. Pl. Gui. 946 (*Acacia Ouyrarema*, DC. Prod. ii. 469), made up of references belonging to *Pithecolobium filicifolium*, and of a Cayenne plant undescribed, but represented among Aublet's by a leaf which may be that of *Pithecolobium adiantifolium* or some allied species. De Candolle's character is taken from a leaf which may or may not be taken from the same species.

Mimosa Sinemariensis, Aubl. Pl. Gui. 945, made up of references belonging to *Inga Feuillei* and of some undescribed plant from Cayenne (where *Inga Feuillei* is unknown), of which no evidence exists. G. Don, Gen. Syst. ii. 388, still further confuses his *Inga sinemariensis* by mixing it up with what appears to be *I. laurina*.

B. *Species which there is every reason to believe are included amongst those above described, but of which I have seen no authentic specimens, and which are so imperfectly described as to render identification, generic or specific, otherwise impossible.*

Prosopis elegans, Spreng. Syst. Cur. Post. 165, from Brazil, *Sello*, may be *Piptadenia rigida* or *P. trisperma*.

Mimosa brevifolia and *M. multiglandulosa*, entered in Spreng. Syst. ii. 205, as Humboldt and Bonpland's from South America, with short diagnoses. The whole of Humboldt's and Bonpland's specimens, in a sufficiently perfect state to admit of identification, and many very imperfect ones which ought to have been passed over, had been previously published either by Willdenow at Berlin or by Kunth at Paris; but it is impossible to guess which of them Sprengel had in view under the above names.

Mimosa angulata, Spreng. Neu. Entd. ii. 158, *M. æmula*, Spreng. Syst. ii. 206, *M. brasiliensis*, Spreng.

l. c. 207, *Acacia flaccida* and *A. setosa*, Spreng. Syst. iii. 137, are all founded on Brazilian specimens collected by Sello. I have several times gone through complete sets of Sello's Brasilian Mimoseæ, which must have included the above species under different names; but Sprengel's diagnoses are so short and deficient that I have been quite unable to identify even the genera of these five. So also *Acacia Berteriana*, Spreng. Syst. iii. 138, non Balb. (*A. Sprengelii*, G. Don, Gen. Syst. ii. 410, non Hook. et Arn.), from Jamaica must be some Mimosea known under another name. I did not find it in the Berterian collections named by Sprengel which I have seen.

Mimosa aggregata, Pers. Syn. ii. 263, from East India, *Herb. Juss.*, must be amongst the well-known East-Indian species; but the diagnosis is insufficient to identify it.

Acacia eriantha, Desv. Journ. Bot. 1814, i. 68, supposed to be from East India; but the stations given for Desvaux's plants are not to be relied upon. The characters given do not agree with any known East-Indian species, and are wholly insufficient for identification with any others. I found no specimen in Desvaux's herbarium.

Albizzia macrothyrsa, Miq. Fl. Ind. Bat. Suppl. 281, from Sumatra, of which the fruit is unknown, is, from the description, most probably either *Pithecolobium bubalinum*, or *P. microcarpum*, two species which without close comparison of specimens it is almost impossible to distinguish when in flower only.

C. *Species described from foliage only, without flowers or fruit, and which cannot be identified even where specimens are preserved. Others belonging to this class which have been approximatively determined, are mentioned under the species to which they are probably referrible.*

Mimosa semispinosa, Linn. Spec. 1508 (*Acacia semispinosa*, Steud. Nom. Bot. ed. 2).

Mimosa coronillæfolia, M. guayaquilensis, M. lentiscifolia, M. rhodacantha, M. rhombifolia, and *M. trinervis*, Pers. Syn. ii. 263, 266 (*Acacia coronillæfolia, A. guayaquilensis, A. lentiscifolia, A. rhodacantha, A. rhombifolia*, and *A. trinervis*, Desf. Cat. Hort. Par. ed. 2. 207, 208).

Acacia cassioides, Willd. Enum. Hort. Berol. 1051, and *A. peruviana*, Humb. et Bonpl. in Willd. *l. c.* 1056, both belonging to one species as far as can be judged of by the young foliage.

Acacia ciliata and *A. patula*, Humb. et Bonpl. in Willd. Enum. Hort. Berol. 1055.

Mimosa indica, Poir. Dict. Suppl. i. 80 (*Acacia indica*, Desv. Journ. Bot. 1814, i. 69).

Mimosa fruticosa, Roxb. Fl. Ind. ii. 549, introduced into the Botanic Garden, Calcutta, from China.

Acacia javanica, DC. Prod. ii. 471, is taken up from *Gleditschia javanica*, Lam. Dict. ii. 466, of which the foliage only is known. In Herb. DC. *A. javanica* is represented by the *A. pennata*.

Acacia virescens, DC. Cat. Hort. Monsp. 74, perhaps the same as *A. cassioides* and *A. peruviana*.

Mimosa Cascabellilo and *Acacia visneoides*, Colla, Hort. Ripul. 91, and App. ii. 339.

Mimosa nepalensis, Acacia ambigua, A. gemella, A. guttata, A. guttulifera, A. oligophylla, A. pectinata (*A. Hoffmanseggii*, DC.), *A. prismatica, A. procumbens, A. subtilis*, and *Inga forficata*, Hoffmans. Verz. Dresd. Gart., all taken up in DC. Prod. or Steud. Nom. Bot. I have not seen Hoffmansegg's work. The specimen I saw looked like that of some *Calliandra*.

Inga molliuscula, Desv. in Ann. Sc. Nat. ser. 1, ix. 427.

Inga dubia, I. mollis, and *I. attenuata*, Grah.! in Wall. Cat. Herb. Ind. n. 5274, 5275, 5276.

Inga ventricosa, Grah.! in Wall. Cat. Herb. Ind. n. 5266, is represented by mere fragments, belonging probably to different species.

Adenanthera polita, Miq. Fl. Ind. Bat. i. pars i. 47. *Albizzia moluccana*, Miq. *l. c.* 26, *A. rubiginosa*, Miq. *l. c.* 27, *A. splendens*, Miq. *l. c.* Suppl. 280, *A. acradena*, Miq. *l. c.* Suppl. 281, and *Pithecolobium fagifolium*, Miq. *l. c.* i. pars i. 35, all from the Malayan archipelago. *Pithecolobium oppositum*, Miq. *l. c.* Suppl. 283, from Sumatra, is said to have the upper leaves opposite, which I have not observed in any *Pithecolobium* or *Albizzia*.

D. *Species entered into travels, garden catalogues, etc. by name only, without diagnoses or description, and yet taken up by Steudel and others.*

Mimosa semicordata, Roxb. Hort. Beng. 40 (*Acacia semicordata*, Steud. Nom. Bot. ed. 2).

Mimosa glandulosa, Chr. Smith in Tuck. Congo, 249, from the Cape-Verd Islands.

Acacia Jurema, Mart. Reise, ii. 788, Syst. Mat. Med. Fl. Bras. 53, is not described, although a chemical analysis is given of the bark.

Acacia curvifolia, Bonpl., *A. coccinea*, Link, and *A. semitriptera*, Mart., all in Steud. Nom. Bot. ed. 2.

Acacia hirta, *A. lucens*, and *A. habbasioides*, Boj. Hort. Maurit. 115, 116, from Madagascar.

Acacia viarum, Allem.; Ten. Cat. Ort. Napol. 77, raised from Brazilian seed.

Mimosa Barclayana, Loud., *Acacia fuscata*, *A. Jacarandæ*, and *Inga afzelioides*, Lodd., *Acacia Lawsoni* and *A. persoonoides*, Ait., *Acacia heteromalla*, *A. guilandinæfolia*, *A. leucoloba*, *A. platyphylla*, and *A. Richardsoni*, Sweet, and *Inga pulcherrima*, Cerv., all entered either in Loudon's or in Sweet's Hortus Britannicus.

Acacia tuberosa, Sterl. in Steud. Nom. Bot. ed. 2.

The following determinations of a few numbered collections more or less generally distributed may be found useful :—

Asiatic and Australian Collections.

Beccari : Borneo.

1134	Pithecolobium fasciculatum.	2751	Pithecolobium montanum.	3491	Pithecolobium borneense.
1447	Parkia Roxburghii.	3060	Pithecolobium lobatum.	3730	Pithecolobium montanum, var.?
1715	Pithecolobium borneense.	3072	Adenanthera pavonina.		
2261	Adenanthera pavonina.	3084	Parkia Roxburghii.	3745	Pithecolobium Clypearia.
2749	Acacia pennata.				

Cuming : Philippines.

475	Pithecolobium lobatum.	1261	Mimosa pudica.	1603	Pithecolobium lobatum.
502	Pithecolobium subacutum.	1372	Mimosa pudica.	1691	Adenanthera pavonina.
953	Acacia pennata.	1499	Acacia cæsia.	1692	Entada scandens.
1166	Acacia concinna.	1563	Albizzia procera.	1854	Pithecolobium lobatum.
1223	Albizzia retusa.	1592	Serianthes grandiflora.		Malacca.
1260	Entada scandens.	1593	Albizzia retusa.	2352	Neptunia oleracea.

Schultz : Port Darwin.

127	Acacia polystachya?	359	Acacia Simsii.	763	Acacia humifusa.
189	Acacia polystachya?	378	Acacia binervata.	795	Neptunia gracilis.
247	Acacia dimidiata.	380	Neptunia gracilis.	870	Acacia polystachya.
248	Acacia tumida?	415	Acacia holosericea.	871	Acacia plectocarpa?
293	Acacia tumida.	432	Acacia tumida.	871	Acacia oncinocarpa?
301	Acacia binervata.	433	Acacia tumida, var.?	872	Acacia tumida.
302	Acacia tumida.	434	Acacia tumida, var.?	873	Acacia latescens.
322	Acacia Simsii.	538	Acacia tumida.	874	Acacia dimidiata.
327	Acacia dimidiata.	550	Acacia tumida.	876	Acacia holosericea.
336	Acacia latescens.				

Wallich's East-Indian Catalogue.

5226	Acacia ferruginea.	5230	Acacia modesta.	5234	Albizzia odoratissima.
5227	Acacia Catechu } specimens	5231	Dichrostachys cinerea.	5235	Albizzia Julibrissin, var.
5228	Acacia Suma } mixed.	5232	Acacia latronum.	5236	Albizzia stipulata.
5229	Acacia Sundra }	5233	Albizzia procera.	5237	Albizzia stipulata.

5238 Albizzia amara.
5239 Leucæna glauca.
5240 Leucæna glauca.
5241 Albizzia myriophylla.
5242 Albizzia myriophylla.
5243 Albizzia stipulata.
5244 Acacia lenticularis.
5245 Acacia latronum.
5246 Acacia arabica.
5247 Acacia tomentosa.
5248 Acacia Intsia.
5249 Acacia Intsia.
5250 Acacia concinna.
5251 Acacia concinna.
5252 Acacia Intsia.
5253 Acacia Intsia.
5254 Acacia pennata.
5255 Acacia pluricapitata.
5256 Acacia Intsia.
5257 Acacia Intsia.
5258 Acacia pennata.
5259 Albizzia amara.
5260 Acacia pennata.
5261 Acacia leucophlœa.
5262 Acacia leucophlœa.
5263 Acacia leucophlœa.
5264 Acacia farnesiana.
5265 Albizzia Lebbek.
5266 Fragmenta sp. dubiæ.
5267 Albizzia lucida.
5267 Pithecolobium bigeminum.
5268 Pithecolobium fasciculatum.
5269 Pithecolobium bigeminum.
5270 Pithecolobium Clypearia.
5270 Pithecolobium angulatum.
5271 Pithecolobium angulatum.
5272 Pithecolobium bubalinum.
5273 Calliandra umbrosa.
5274 Folia sp. dubiæ.
5275 Folia sp. dubiæ.
5276 Folia sp. dubiæ.
5277 Xylia dolabriformis.
5278 Xylia dolabriformis.
5279 Xylia dolabriformis.
5280 Pithecolobium lobatum.
5281 Pithecolobium bigeminum.
5282 Pithecolobium dulce.
5283 Pithecolobium contortum.
5284 Pithecolobium contortum.
5285 Serianthes grandiflora.
5286 Calliandra geminata.
5287 Pithecolobium umbellatum.
5288 Parkia Roxburghii.
5289 Mimosa rubicaulis.
5290 Mimosa hamata.
5291 Mimosa latispinosa.
5292 Mimosa pudica.
5293 Entada scandens.
5294 Entada scandens.
5295 Neptunia oleracea.
5296 Desmanthus triqueter.
5297 Desmanthus virgatus.
5298 Neptunia plena.
5299 Prosopis spicigera.
5300 Adenanthera pavonina.

South-American Collections.

Appun: British Guiana.

15 Mimosa polydactyla.
33 Pentaclethra filamentosa.
312 Calliandra surinamensis.
333 Pithecolobium adiantifolium.
337 Mimosa myriadena.
373 Inga nobilis.
386 Pithecolobium latifolium.
400 Inga Thibaudiana.
829 Pithecolobium adiantifolium.
1611 Pithecolobium cauliflorum.
1844 Piptadenia peregrina.
2043 Mimosa asperata.

Blanchet: Brazil.

86 A Inga ciliata.
222 Inga subnuda.
282 Inga bullata.
397 Stryphnodendron floribundum.
1551 Piptadenia laxa.
1596 Pithecolobium filamentosum.
1602 Piptadenia laxa.
1684 Affonsea densiflora.
1832 Inga fagifolia.
1848 Pithecolobium polycephalum.
2584 Calliandra Blancheti.
2597 Mimosa cordistipula.
2620 Calliandra viscidula.
2632 Inga Blanchetiana.
2670 Pithecolobium diversifolium.
2697 Mimosa modesta.
2700 Neptunia plena.
2701 Piptadenia moniliformis.
2756 Pithecolobium multiflorum.
2761 Piptadenia colubrina.
2762 Enterolobium Timbouva.
2764 Pithecolobium cauliflorum.
2772 Acacia monacantha.
2776 Pithecolobium Blancheti.
2816 Calliandra sessilis.
2833 Calliandra leptopoda.
2850 Mimosa pteridifolia.
2868 Parkia polycephala.
2869 Mimosa verrucosa.
2870 Mimosa acutistipula.
2899 Piptadenia moniliformis.
2912 Mimosa rhodostachya.
3018 Inga Thibaudiana.
3080 A Affonsea juglandifolia.
3083 A Acacia riparia.
1082 A Piptadenia laxa.
3083 A Inga subnuda.
3136 Pithecolobium foliolosum.
3295 Piptadenia Blancheti.
3315 Calliandra axillaris.
3319 Inga marginata.
3327 Enterolobium elliptieum.
3338 Inga cylindrica.
3375 Plathymenia foliolosa.
3408 Stryphnodendron rotundifolium.
3423 Pithecolobium dumosum.
3432 Pithecolobium dumosum.
3679 Mimosa Blancheti.
3680 Inga cylindrica.
3681 Pithecolobium corymbosum.
3683 Calliandra calycina.
3685 Pithecolobium foliolosum.
3686 Piptadenia laxa.
3687 Mimosa subenervis.
3708 Acacia.
3772 Acacia monacantha.
3779 Pithecolobium corymbosum.
3800 Calliandra depauperata.

Burchell: Brazil.

711 Mimosa sepiaria.
729 Mimosa Velloziana.
794 Acacia velutina.
803 Mimosa elliptica.
897 Piptadenia latifolia.
944 Pithecolobium Auaremotemo.
1080 Piptadenia colubrina.
1196 Acacia glomerosa.
1215 Mimosa elliptica.
1355 Mimosa elliptica.
1427 Acacia lacerans.
1453 Piptadenia nitida.
1465 Acacia paniculata.
1485 Mimosa elliptica.
1594 Mimosa elliptica.
1641 Leucæna glauca.
1688 Acacia velutina.
1827 Inga nutans?
1851 Inga Luschnathiana.
1856 Acacia glomerosa.
1975 Acacia lacerans.
1984 Inga barbata.
2337 Inga Luschnathiana.
2556 Inga campanulata.
2622 Inga Thibaudiana.
2648 Mimosa sepiaria.
2699 Mimosa extensa.
2711 Inga uruguensis.
2784 Piptadenia communis.
2787 Mimosa Velloziana.
2824 Acacia velutina.
2952 Mimosa Velloziana.
2970 Acacia adhærens.
3031 Acacia farnesiana.
3032 Albizzia Lebbek.
3036 Inga Luschnathiana.
3039 Lucæna glauca.
3049 Piptadenia laxa.
3108 Pithecolobium sanguineum.
3176 Inga fagifolia, var.
3379 Pithecolobium lusorium.
3414 Pithecolobium lusorium.
3435 Piptadenia communis.
3420 Mimosa Velloziana.
3545 Acacia grandistipula.
3816 Pithecolobium Langsdorfii.
3869 Inga barbata.
4053 Mimosa dolens.
4072 Mimosa furfuracea.
4232 Mimosa Selloi.
4244 Inga uruguensis.
4277 Mimosa dolens.
4605 Pithecolobium Langsdorfii.
4626 Piptadenia communis.
4672 Mimosa sepiaria.
4705–14 Mimosa Selloi.
4724–2 Mimosa sepiaria.
4749 Mimosa dolens.
4758 Piptadenia colubrina.
4762–2 Mimosa Selloi.
4779 Pithecolobium Langsdorfii.
4794 Piptadenia communis.
4835 Piptadenia falcata.
4843 Acacia riparia.
4844 Acacia grandistipula.
4909 Stryphnodendron Barbadetimam.
4934 Acacia paniculata.
5028 Mimosa conferta.
5096 Piptadenia falcata.
5103 Stryphnodendron Barbadetimam.
5174 Enterolobium ellipticum.
5176 Mimosa rixosa.
5233 Piptadenia falcata.
5235 Piptadenia falcata.
5253 Enterolobium ellipticum.
5309 Leucæna glauca.
5346 Enterolobium ellipticum.
5361 Inga marginata.
5363 Mimosa lævigata.
5368 Mimosa distans.
5452 Mimosa melanocarpa.
5479 Piptadenia falcata.
5485 Mimosa dolens.
5581–2 Stryphnodendron Barbadetimam.
5600 Stryphnodendron polyphyllum.
5686 Mimosa paucifolia.
5705 Calliandra macrocephala.
5736 Mimosa densa.
5747–2 Stryphnodendron Barbadetimam.
5809 Enterolobium ellipticum.
5835 Inga insignis.
5838 Mimosa melanocarpa.
5909 Calliandra virgata.
5913 Calliandra parviflora.
5913–2 Mimosa Clausseni.
5941 Mimosa Clausseni.
5968 Mimosa paludosa.
5974 Inga fagifolia.
6020 Piptadenia peregrina.
6022 Mimosa setosa.
6053 Calliandra virgata.
6066 Mimosa radula.
6081 Calliandra parviflora.
6088 Mimosa lævigata.
6089 Plathymenium reticulatum.
6114 Mimosa axillaris.
6121 Mimosa invisa.
6130–2. Mimosa falcipinna.
6170 Mimosa multipinna.
6196 Mimosa gracilis.
6204 Mimosa rudis.
6232 Calliandra mertensioides, var.
6287 Piptadenia macrocarpa.
6315 Calliandra parviflora.
6329 Acacia glomerosa.
6399 Plathymenia reticulata.
6482 Calliandra parviflora.
6488 Mimosa distans.
6538 Calliandra longipes.
6584 Mimosa trijuga.
6625 Acacia adhærens.
6626 Acacia glomerosa.
6657 Mimosa brachycarpa.
6670 Mimosa neuroloma.
6681 Mimosa Gardneri.
6700–4 Desmanthus depressus.
6700–14 Mimosa multipinna.
6700–15 Mimosa Gardneri.
6715–2 Calliandra microphylla.
6739 Mimosa vestita.
6779 Mimosa vestita.
6790 Mimosa neuroloma.
6848 Mimosa Clausseni.
6882–2 Mimosa vestita.
6942 Mimosa Velloziana.
6951 Mimosa Clausseni.
6967 Plathymenium reticulatum.
6973 Mimosa invisa.
7058 Mimosa leptocaulis.
7071–2 Mimosa Velloziana.
7188 Calliandra longipes.
7216 Inga nobilis.
7307 Mimosa adhærens.
7361 Mimosa melanocarpa.
7387 Mimosa verecunda.
7390 Inga marginata.
7403 Inga spuria.
7445 Mimosa concinna.
7461 Mimosa neuroloma.
7471 Mimosa echinocarpa.
7490 Mimosa capillipes.
7499 Calliandra longipes.
7507 Mimosa setosa.
7518 Mimosa macrocephala.

7526 Calliandra surinamensis.
7563 Mimosa concinna.
7564 Mimosa Clausseni.
7576 Mimosa Clausseni.
7577 Mimosa vestita.
7587 Mimosa foliolosa.
7632 Inga affinis.
7651 Mimosa hirsuta.
7653 Calliandra macrocephala.
7672 Calliandra myriophylla.
7678 Mimosa asperata.
7686 Mimosa Clausseni.
7694 Mimosa macrocephala.
7704 Mimosa densa, var.
7702–2 Mimosa macrocephala.
7713 Mimosa scabrella ?
7724 Mimosa melanocarpa.
7737 Mimosa lasiocarpa.
7802 Mimosa longipes.
7834 Mimosa vestita.
7834–2 Mimosa longipes.
7862–2 Mimosa macrocephala.
7886 Mimosa Clausseni.
7915 Mimosa Clausseni.
7983 Piptadenia colubrina.
8003 Calliandra Gardneri.
8007 Calliandra macrocephala.
8025 Mimosa nitens.
8048 Mimosa asperata.
8075–2 Calliandra macrocephala.
8077 Mimosa nitens.
8122 Mimosa vestita.
8142 Mimosa neuroloma.
8148–2 Mimosa distans.
8161 Calliandra parviflora.
8162 Acacia Martii.
8183 Mimosa Burchellii.
8192 Mimosa bijuga.
8193 Mimosa hirsuta.
8199 Mimosa hirsuta.
8200 Mimosa barbigera.
8201 Mimosa angusta.
8219 Mimosa angusta.
8244 Mimosa brachycarpa.
8247 Mimosa cinerea.
8343 Stryphnodendron obovatum.
8402 Plathymenia foliolosa.
8481 Schrankia leptocarpa.
8535 Inga affinis.
8541 Enterolobium ellipticum.
8573 Mimosa asperata.
8618 Mimosa somnians, var.
8628–2 Plathymenium reticulatum.
8687 Mimosa desmodioides.
8711 Mimosa glomerosa.
8899 Mimosa viscida.
8949 Mimosa microphylla.
8962 Pithecolobium glomeratum.
9003 Mimosa apodocarpa.
9011 Mimosa viscida.
9025 Mimosa asperata.
9048 Mimosa invisa.
9109 Inga velutina.
9214 Mimosa polycarpa.
9263 Inga strigillosa.
9267 Inga heterophylla.
9331 Pentaclethra filamentosa.
9341 Entada polyphylla.
9344 Mimosa rufescens.
9355 Inga myriantha.
9380 Pentaclethra filamentosa.
9427 Pithecolobium cochleatum.
9446 Inga virgultosa.
9448 Pithecolobium trapezifolium.
9467 Inga nitida.
9482 Calliandra surinamensis.
9505–2 Pithecolobium cochleatum.
9521 Mimosa asperata.
9522 Schrankia leptocarpa.
9541–2 Acacia farnesiana.
9599 Mimosa sensitiva.
9610 Inga Salzmanniana.
9610 Inga edulis.
9614 Inga nitida.
9626 Inga heterophylla.
9656 Parkia pendula.
9672 Pithecolobium trapezifolium.
9718 Inga Thibaudiana.
9731 Inga heterophylla.
9772 Mimosa somnians.
9871 Pentaclethra filamentosa.
9883 Inga nobilis.
9915 Mimosa asperata.
9970–2 Calliandra surinamensis.
10021–7 Mimosa sensitiva.
10040 Mimosa casta.
10068 Inga edulis.
10084 Pithecolobium corymbosum.
10091 Inga velutina.

Fendler: Panama.

67 Inga spectabilis.
87 Pithecolobium latifolium.
88 Pithecolobium latifolium.
89 Inga punctata, var.
90 Pithecolobium latifolium.
91 Mimosa Velloziana.
96 Mimosa pudica.
97 (or 67?) Inga spectabilis.
98 Mimosa asperata.

Fendler: Venezuela.

195 Pithecolobium Saman.
264 Inga villosissima.
317 Acacia tamarindifolia.
333 Acacia riparia.
334 Acacia riparia.
342 Mimosa asperata.
343 Mimosa pudica.
344 Mimosa tovarensis.
345 Acacia riparia.
347 Acacia farnesiana.
348 Acacia tortuosa.
349 Mimosa floribunda, var.?
350 Leucæna trichodes.
351 Acacia paniculata.
352 Calliandra falcata.
353 Calliandra laxa.
354 Calliandra laxa.
355 Calliandra caracasana.
356 Calliandra tetragona.
357 Desmanthus depressus.
358 Calliandra gracilis.
359 Mimosa arenosa inermis.
360 Mimosa arenosa aculeata.
361 Piptadenia psilostachya.
362 Acacia macracantha.
363 Inga Œrstediana.
364? Inga villosissima.
365 Inga Lindeniana.
366 Inga panamensis.
367 Inga marginata.
368 Inga punctata.
369 Inga punctata.
370 Schrankia leptocarpa.
371 Pithecolobium tortum.
372 Pithecolobium unguis-cati.
373 Pithecolobium dulce.
458 Inga Lindeniana.
1859 Mimosa debilis.
1860 Pithecolobium Saman.
1867 Mimosa polycarpa.
1868 Mimosa camporum.
1869 Calliandra laxa, var.

1870 Mimosa Cabrera.
1873 Pithecolobium tortum.
1874 Piptadenia peregrina.
1875 Pithecolobium ligustrinum.
2244 Mimosa schrankioides.
2245 Mimosa spiciflora.
2246 Prosopis juliflora.
2248 Acacia macracantha.
2249 Entada polystachya.
2250 Pithecolobium tortum.
2251 Pithecolobium tortum.
2253 Calliandra Seemanni.
2254 Calliandra C. laxæ aff.
2255 Calliandra laxa, var.
2256 Calliandra Fendleri.
2257 Enterolobium cyclocarpum.
2258 Inga spuria.
2259 Inga Fendleriana.
2260 Inga Œrstediana.

Gardner : Brazil.

22 et 23 Calliandra Harrisii.
201 Inga affinis.
359 Acacia recurva.
360 Acacia adhærens.
361 Acacia grandistipula.
362 Inga barbata.
363 Inga sessilis.
364 Stryphnodendron polyphyllum.
365 Inga marginata.
750 Inga bullata.
751 Inga maritima.
889 Mimosa pudica.
891 Leucæna glauca.
977 Acacia farnesiana.
978 Piptadenia communis.
979 Mimosa sepiaria.
980 Mimosa polydactyla.
981 (v. 982) Mimosa sensitiva.
982 (v. 981) Desmanthus virgatus.
983 Mimosa asperata.
984 Inga fagifolia.
985 Ingæ affinis var.
986 Stryphnodendron floribundum.
1280 Pithecolobium Saman.
1281 Acacia paniculata.
1579 Enterolobium Timbouva.
1580 Desmanthus virgatus.
1581 Calliandra umbellifera.
1582 Parkia polycephala.
1583 Inga fagifolia.
1584 Piptadenia macrocarpa.
1585 Mimosa asperata.
1586 Mimosa leptantha.
1587 Mimosa rhodostachya.
1588 Mimosa malacocentra.
1589 Plathymenia foliolosa.
1940 Acacia glomerosa.
1941 Acacia paniculata.
1942 Mimosa paludosa.
1943 Piptadenia communis.
1945 Stryphnodendron rotundifolium.
1946 Pithecolobium dumosum.
2132 Mimosa ursina.
2133 Mimosa bijuga.
2134 Mimosa misera.
2135 Mimosa acutistipula.
2136 Mimosa verrucosa.
2137 Mimosa cæsalpiniæfolia.
2138 Calliandra leptopoda.
2139 Piptadenia moniliformis.
2554 Pithecolobium diversifolium.
2555 Calliandra umbellifera.
2556 Calliandra abbreviata.
2557 Pithecolobium multiflorum.
2558 Piptadenia biuncifera.
2830 Mimosa sericantha.
2831 Mimosæ sp. dubia.
2832 Mimosa polycephala.
2833 Mimosa sericantha.
2834 Enterolobium ellipticum.
2835 Calliandra abbreviata.
3128 Calliandra Gardneri.
3129 Calliandra macrocephala.
3130 Calliandra parviflora.
3131 Mimosa angusta.
3132 Mimosa barbigera.
3133 Mimosa lupulina.
3134 Mimosa Gardneri, var.
3135 Mimosa distans.
3136 Mimosa Gardneri.
3702 Calliandra dysantha.
3703 Calliandra Gardneri.
3704 Mimosa invisa.
3705 Mimosa goyazensis.
3706 Mimosa leiocephala.
3707 Mimosa discolor.
4123 Mimosa pteridifolia.
4124 Calliandra dysantha.
4520 Mimosa pogocephala.
4521 Mimosa calodendron, var.
4522 Mimosa aurivillus.
4523 Calliandra bracteosa.
4524 Calliandra bracteosa.
4525 Calliandra foliolosa.
4526 Inga flagelliformis.
5446 Piptadenia peregrina.
5447 Inga nutans.

Glaziou : Brazil.

620 Albizzia Lebbek.
621 Inga nutans.
624 Mimosa sepiaria.
626 Enterolobium Schomburgkii.
627 Pithecolobium Langsdorfii.
629 Acacia glomerosa.
632 Acacia pteridifolia.
662 Mimosa asperata.
1143 Enterolobium Schomburgkii.
1379 Inga maritima.
1380 Inga capitata, var.?
1493 Leucæna glauca.
1565 Pithecolobium Glazioui.
1566 Pithecolobium Auaremotemo.
1567 Piptadenia contorta.
1587 Mimosa rhodostachya.
2122 Inga lenticellata.
2549 Inga nutans.
2550 Inga marginata.
2972 Parkia multijuga.
2973 Pithecolobium Langsdorfii.
2974 Pithecolobium Langsdorfii.
2975 Inga lanceæfolia.
2976 Inga Luschnathiana.
2977 Inga cordistipula.
3414 Pithecolobium longiflorum.
3722 Piptadenia latifolia.
3783 Mimosa Glazioui.
3786 Pithecolobium longiflorum.
3933 Inga Sellowiana, var.
3934 Inga barbata.
3935 Inga edulis, var.
3936 Inga cordistipula.
3937 Affonsea bullata.
4793 Inga flagelliformis.
4794 Inga capitata.
4795 Affonsea juglandifolia.
4796 Inga lenticellata.
4797 Inga ciliata.

5825 Inga fagifolia.
5828 Piptadenia laxa.
5829 Piptadenia polyptera.
5830 Piptadenia macrocarpa.
5831 Piptadenia colubrina et
5831 Mimosa sepiaria.
5833 Pithecolobium polycephalum.
5834 Piptadenia communis.
5835 Acacia lacerans.
5836 Acacia glomerosa.
5837 Pithecolobium incuriale.
5838 Desmanthus virgatus.
5839 Mimosa malacocentra.
5841 Mimosa Velloziana, var.
5842 Mimosa invisa.
5844 Mimosa pudica.
6188 Pithelocobium lusorium, var.
6189 Acacia Miersii.
6191 Mimosa Glazioui.
6192 Pithecolobium Langsdorfii.

Hostmann : Surinam.

77 Inga Burgoni.
149 Pithecolobium glomeratum.
152 Mimosa myriadena.
170 Inga sciadion.
171 Calliandra surinamensis.
174 Pithecolobium cauliflorum.
214 Pithecolobium corymbosum.
237 Inga sertulifera.
258 Inga capitata.
261 Pithecolobium cauliflorum.
262 Pithecolobium corymbosum.
353 Acacia farnesiana.
447 Entada polystachya.
459 Albizzia Lebbek.
479 Pithecolobium trapezifolium.
587 Neptunia plena.
627 Mimosa pudica.
667 Neptunia plena.
676 Inga splendens.
685 Inga ingoides.
708 Inga splendens.
807 Inga Thibaudiana.
813 Mimosa camporum, var.
830 Inga nobilis.
858 Inga scabriuscula.
884 Inga ingoides.
887 Inga scabriuscula.
971 Inga nobilis.
976 Inga Burgoni.
1012 Parkia nitida.
1033 Pentaclethra filamentosa.
1067 Inga acrocephala.
1157 Inga setifera.
1173 Pithecolobium cauliflorum.
1190 Pithecolobium corymbosum.
1194 Inga heterophylla.
1205 Mimosa debilis.
1233 Mimosa debilis.
1245 Pithecolobium multiflorum.
1277 Pithecolobium adiantifolium.
1690 Inga Burgoni.

Regnell : Brazil.

Coll. I.

90 Mimosa distans.
91 Mimosa insidiosa.
92 Mimosa conferta et M. tremula.
92* Mimosa insidiosa.
93 Mimosa dolens.
93½ Mimosa rigida.
94 Acacia farnesiana.
95 Acacia adhærens et A. paniculata.
96 Mimosa rixosa.
97 Inga marginata.
98 Inga vulpina.
99 Calliandra brevipes.

Coll. II.

92 Enterolobium Timbouva.
93 Mimosa Regnelli.
94 Acacia polyphylla.
94* Acacia glomerosa.
95 Mimosa lævigata.
96 Pithecolobium incuriale.
97 Mimosa cylindracea.

Coll. III.

494 Mimosa sensitiva.
494* Mimosa rixosa.
495 Mimosa nuda, var.
496 Mimosa trichocephala.
497 Mimosa ramosissima.
498 Mimosa hirsuta.
499 Mimosa pogonoclada.
499* Mimosa humifusa.
500 Mimosa incana.
501 Mimosa tremula.
502 Mimosa neuroloma.
503 Mimosa subsericea.
504 Mimosa furfuracea.
507 Mimosa asperata.
508 Mimosa invisa.
509 Mimosa capillipes.
510 Mimosa melanocarpa.
512 Mimosa paucifolia.
512 Enterolobium ellipticum.
513 Stryphnodendron Barbadetimam.
514 Plathymenia reticulata.
515 Plathymenia reticulata.
516 Calliandra myriophylla.
516* Calliandra microphylla.
517 Piptadenia peregrina.
517* Piptadenia falcata.
519 Inga Luschnathiana.
520 Inga striata.
521 Inga sessilis.
522 Calliandra macrocephala.

Robert Schomburgk : Guiana and Brazil, 1st coll.

25 Inga disticha.
226 Inga nobilis.
284 Pithecolobium trapezifolium.
320 Pithecolobium adiantifolium.
364 Inga splendens.
471 Pithecolobium glomeratum.
471 Inga Burgoni.
487 Pithecolobium latifolium.
487 Pithecolobium cauliflorum.
498 Pentaclethra filamentosa.
530 Pithecolobium multiflorum.
534 Inga setifera.
582 Calliandra stipulacea.
595 Inga Ruiziana.
604 Entada polyphylla.
715 Mimosa Schomburgkii.
725 Mimosa camporum.
740 Pithecolobium pubescens.
740 Inga brevipes.
751 Neptunia plena.
795 Inga stenoptera.

848 Mimosa sensitiva.
852 Acacia riparia.
852 Piptadenia peregrina.
866 Piptadenia peregrina.
874 Enterolobium Schomburgkii.
903 Mimosa invisa.
917 Mimosa myriadena.
931 Schrankia leptocarpa.
973 Parkia discolor cum foliis Heterostemonis mimosoidis.

Robert and Richard Schomburgk: Guiana, 2d coll.

Rob. S.	Rich. S.	
31		Inga nobilis.
62		Inga nobilis.
70		Pithecolobium glomeratum.
72		Inga coruscans.
105	= 53	Pentaclethra filamentosa.
114	= 160	Pithecolobium corymbosum.
124	= 50	Inga pezizifera.
158	= 99	Pithecolobium glomeratum.
188	= 180	Pithecolobium cauliflorum.
214		Inga coruscans.
299	= 586	Acacia paniculata.
313	= 497	Mimosa Schomburgkii.
380	= 645	Mimosa Selloi?
387	= 353	Pithecolobium adiantifolium.
396	= 493	Piptadenia peregrina.
469	= 758	Pithecolobium glomeratum.
470	= 765	Mimosa schrankioides.
490	= 756	Pithecolobium multiflorum.
493	= 763	Acacia polyphylla.
494	= 767	Entada polystachya.
495	= 768	Acacia riparia.
508	= 788	Mimosa pudica.
524	= 814	Mimosa microcephala.
525	= 824	Pithecolobium polycephalum.
571	= 806 et 1419	Calliandra laxa.
586	= 959	Inga setifera.
663	= 994	Pithecolobium ferrugineum.
695	= 1080	Inga bracteosa.
751	= 1400	Inga myriantha, var.
756	= 1396	Inga graciliflora.
799	= 1433	Stryphnodendron guianense.
810	= 1427	Inga sertulifera.
822	= 1415	Pithecolobium inæquale.
829	= 1391	Inga leiocalycina.
831	= 1423	Inga spuria v.I.affinis?
839	= 1419	Inga nobilis.
852	= 1474	Mimosa myriadena.
918	= 1443	Inga fagifolia.

Spruce: Brazil, Peru, and Ecuador.

233 Mimosa camporum, var.
236 Inga nobilis.
243 Mimosa asperata.
245 Pithecolobium trapezifolium.
246 Inga alba.
249 Acacia farnesiana.
252 Entada polyphylla.
253 Inga sertulifera.
254 Pentaclethra filamentosa.
259 Calliandra surinamensis.
263 Mimosa sensitiva.
284 Mimosa asperata.
389 Calliandra tenuiflora.
416 Mimosa myriadena.
438 Mimosa asperata.
447 Schrankia leptocarpa.
484 Inga longiflora.
494 Acacia paniculata.
518 Mimosa orthocarpa.
529 Stryphnodendron floribundum.
571 Parkia discolor.
667 Inga nobilis.
671 Pithecolobium Saman.
730 Mimosa somnians.
771 Pithecolobium campestre.
783 Mimosa debilis.
789 Schrankia leptocarpa.
813 Inga heterophylla.
816 Neptunia oleracea.
820 Mimosa myriadena.
828 Piptadenia peregrina.
882 Pithecolobium parvifolium.
910 Inga microcalyx.
917 Pithecolobium cauliflorum.
960 Pithecolobium corymbosum.
962 Inga edulis.
973 Inga speciosa.
976 Mimosa Velloziana.
977 Inga microcalyx.
1016 Inga cylindrica.
1023 Inga lateriflora.
1076 Inga alba.
1078 Parkia pendula.
1088 Pithecolobium niopoides.
1100 Inga marginata.
1108 Inga dumosa.
1111 Entada polyphylla.
1126 Pithecolobium latifolium.
1164 Schrankia leptocarpa.
1165 Mimosa Spruceana.
1197 Mimosa asperata.
1208 Parkia auriculata.
1218 Stryphnodendron floribundum.
1228 Calliandra trinervia.
1240 Mimosa invisa.
1264 Inga scabriuscula.
1328 Pithecolobium inæquale.
1334 Inga heterophylla.
1336 Pithecolobium adiantifolium.
1404 Pithecolobium divaricatum.
1409 Inga lateriflora.
1418 Inga obtusata.
1434 Inga stipularis.
1473 Parkia oppositifolia.
1534 Acacia polyphylla.
1554 Inga scabriuscula.
1555 Inga nobilis.
1586 Calliandra scutellifera.
1638 Neptunia oleracea.
1651 Inga cinnamomea.
1658 Pithecolobium marginatum.
1665 Inga setifera.
1681 Entada polyphylla.
1690 Pentaclethra filamentosa.
1691 Stryphnodendron floribundum.
1694 Pithecolobium divaricatum.
1697 Acacia amazonica.
1706 Inga myriantha.
1706* Inga micradenia.
1717 Pithecolobium glomeratum.
1750 Inga scabriuscula.

1755 Inga strigillosa.
1786 Piptadenia peregrina.
1787 Inga rufinervis.
1802 Pithecolobium auriculatum.
1810 Pithecolobium Spruceanum.
1816 Inga dysantha.
1826 Enterolobium Schomburgkii.
1852 Pithecolobium amplum.
1862 Stryphnodendron floribundum.
1914 Inga setifera.
2002 Pithecolobium unifoliolatum.
2052 Mimosa rufescens.
2058 Mimosa myriadena.
2091 Pithecolobium cauliflorum.
2252 Pithecolobium claviflorum.
2267 Inga scabriuscula.
2283 Pithecolobium inæquale.
2288 Pithecolobium microcalyx.
2289 Inga alba.
2351 Pithecolobium lætum.
2400 Mimosa punctulata.
2425 Pithecolobium panurense.
2429 Pithecolobium corymbosum.
2430 Inga plumifera.
2471 Pithecolobium floribundum.
2551 Inga lucida.
2566 Inga umbellifera.
2629 Inga panurensis.
2727 Parkia panurensis.
2743 Pithecolobium microcalyx.
2786 Pithecolobium leucophyllum.
2805 Piptadenia uaupensis.
2877 Pithecolobium claviflorum.
2886 Pithecolobium cauliflorum.
2893 Mimosa annularis.
2925 Pithecolobium lindseæfolium.
2968 Pithecolobium glomeratum.
2977 Inga negrensis.
3060 Mimosa microcephala.
3096 Mimosa rufescens.
3097 Inga speciosa.
3183 Mimosa myriadena.
3187 Inga nobilis.
3320 Pithecolobium marginatum.
3329 Pithecolobium simabæfolium.
3364 Pithecolobium corymbosum.
3372 Pithecolobium trapezifolium.
3414 Pithecolobium longiflorum.
3478 Calliandra trinervia.
3561 Inga heterophylla.
3626 Mimosa microcephala.
3627 Mimosa microcephala.
3654 Mimosa tomentosa.
3664 Inga splendens.
3673 Pithecolobium cauliflorum.
3786 Pithecolobium longiflorum.
3788 Inga laterifolia.
3795 Inga fagifolia.
4112 Pithecolobinm macrophyllum.
4126 Inga stenoptera.
4185 Pithecolobium Mathewsi.
4221 Inga tarapotensis.
4235 Calliandra bombycina.
4405 Pithecolobium Saman.
4407 Pithecolobium polycephalum.
4408 Acacia glomerosa, var.
4466 Calliandra angustifolia.
4480 Acacia paniculata.
4494 Calliandra amazonica.
4503 Inga Pavoniana.
4504 Inga pycnostachya.
4518 Acacia polyphylla.
4536 Piptadenia pteroclada.
4548 Acacia farnesiana.
4565 Inga I. diademati aff.
4583 Inga heterophylla.
4882 Inga stenocalyx.
4915 Inga Thibaudiana, var.
4926 Calliandra amazonica.
4935 Inga longipes.
4966 Calliandra Magdalenæ.
5054 Calliandra aculeata.
5096 Inga insignis.
5124 Inga marginata.
5475 Mimosa floribunda.
5571 Calliandra glyphoxyla.
5892 Mimosa quitensis.
6058 Mimosa andina.
6063 Acacia macracantha.
6162 Inga nobilis.
6163 Calliandra tetragona.
6306 Pithecolobium excelsum.
6330 Pithecolobium daullense.
6381 Desmanthus virgatus, var.
6382 Mimosa floribunda.

North-American Collections.

Andrieux: Mexico.

395 Pithecolobium acatlense.
396 Acacia acatlensis.
397 Mimosa polyantha.
398 Acacia filicina glabrata.
399 Mimosa biuncifera.
400 Mimosa mollis.
401 Calliandra malacophylla.
402 Mimosa floribunda.
403 Lysiloma tergemina.
404 Calliandra capitata.
405 Calliandra eriophylla.
407 Neptunia plena.
409 Entada polystachya.

Berlandier: Mexico and Texas.

127 Acacia amentacea.
143 Acacia farnesiana.
153 Dubia.
597 Acacia Berlandieri.
609 Acacia Wrightii.
610 Desmanthus depressus.
611 Neptunia pubescens.
627 Acacia Berlandieri.
661 Mimosa acanthocarpa.
698 Mimosa strigillosa.
703 Acacia Wrightii.
728 Acacia sphærocephala.
779 Acacia Coulteri.
807 Leucæna pulverulenta.
815 Mimosa malacophylla glabra.
842 Acacia flexicaulis.
868 Leucæna pulverulenta.
872 Mimosa
908 Acacia farnesiana.
916 Acacia flexicaulis.
940 Pithecolobium brevifolium.
1035 Desmanthus depressus.
1369 Acacia farnesiana.
1387 Acacia amentacea.
1413 Acacia amentacea.
1605 Schrankia uncinata.
1851 Neptunia lutea.
2006 Acacia Berlandieri.
2019 Acacia Wrightii.
2020 Desmanthus depressus.
2021 Neptunia pubescens.
2037 Acacia Berlandieri.
2115 Mimosa strigillosa.
2120 Acacia Wrightii.
2145 Acacia sphærocephala.
2146 Pithecolobium dulce.

2199	Acacia Coulteri.	2346	Acacia flexicaulis.	3145	Mimosa M. monancistræ aff.
2227	Leucæna pulverulenta.	2370	Pithecolobium brevifolium.	3146	Mimosa Berlandieri.
2235	Mimosa malacophylla glabra.	2465	Desmanthus depressus.	3147	Pithecolobium albicans.
2251	Mimosa M. monancistræ aff.	2510	Acacia filicina.	3148	Acacia micrantha.
2262	Acacia flexicaulis.	2513	Schrankia aculeata.	3149	Acacia Wrightii.
2288	Leucæna pulverulenta.	3002	Mimosa strigillosa.	3150	Acacia Wrightii.
2302	Mimosa	3144	Lysiloma desmostachya.	3151	Acacia filicina.
2338	Acacia farnesiana.				

ADDENDA.

1. Fossil Mimoseæ.

In the prefatory matter to the present paper I have made no reference to any fossil remains of Mimoseæ; for at the time of drawing it up I had no ready means of ascertaining what evidence on the subject had been supplied by palæontologists, and I had not yet heard from Professor Schimper, who had kindly promised to communicate with me on the subject. Since, however, the early sheets of this paper were printed off, the third volume of his magnificent work on Vegetable Palæontology has reached us; and in it I find that a number of supposed fossil Mimoseæ from the Central-European Tertiary are described and figured, and referred severally to the genera *Prosopis*, *Inga*, *Entada*, *Mimosa*, and *Acacia*. The great majority of the species so determined are founded on impressions of leaves only; and these I pass entirely over; for although without collateral evidence it is impossible to deny that they may belong to the genera in question, it is equally impossible to affirm that they do so belong; for none of them show forms or venation exclusively characteristic of any of these genera. I thus see no reason to conclude on this evidence that any *Inga*, *Mimosa*, or *Phyllodineous Acacia* was in any part of the Tertiary period an inhabitant of that part of Europe, when other evidence would tend to an opposite conclusion. With regard to *Prosopis*, the presumption that it might have been there is to my mind neither confirmed nor refuted by the fossil impressions described as *Prosopis* leaflets. On the other hand, those fruits of which so many excellent impressions are figured by Schimper, point to species of *Acacia*, *Entada*, and perhaps *Albizzia*, very similar to those now found in Africa—a case analogous to that of the *Podogonium*, of which specimens so very perfect have been preserved as to enable us satisfactorily to identify it as closely allied to some African Cæsalpineous genera not yet quite extinct.

Descending to particulars, the fruits figured by Schimper, plate cvi. figs. 4, 5, 6, 7, 12 and 13, all referred to *Acacia*, are probably correctly determined, and represent species of the groups *Gummiferæ* and *Vulgares*, both of which are at the present day abundant in Africa. Fig. 4, indeed, if the leaves of figs. 1 and 2 really belong to it, must be very near to the *A. Catechu* of the present day. The pods, figs. 20 and 21, are determined as *Mimosæ*; but if I had had such pods shown to me in a fresh state, I should have referred them without hesitation to *Acacia*. Fig. 20 is exceedingly like the pod of *A. constricta* from the United States, and very near to that of a few very narrow-fruited Gummiferous

Acaciæ of Africa, as well as to some of the Australian Phyllodineæ. Fig. 21 is very like the pod of several *Acaciæ* of the group *Vulgares*, which, when rotting, often break up irregularly, as shown in the drawing. Both are very unlike any *Mimosa*-pods known to me. In this genus the lines separating the articles of the valve are always quite straight, and at right angles to the margin. Figs. 8 and 9, referred to *Acacia*, are more like the pods of some species of *Cassia*. Figs. 23 and 24 may represent *Albizzia*-pods. Fig. 22 may be an *Entada*, as determined, though not any recent species; but it is also nearly as much like some *Ormosia* pods. Both these genera are still represented in Africa.

2. Species novæ et Synonyma omissa.

The following are either synonyms accidentally overlooked, or supposed new species of which the descriptions have reached me since the present paper has been in the printer's hands. I have not seen specimens of any of them.

P. 365, after *Adenanthera Bonplandiana*, add:

Prosopis Bonplandiana, Spreng. Syst. Cur. Post. 165.

P. 373, Piptadenia peregrina.

Acacia trichophylloides, Macfad. Fl. Jam. 320, is referred by Grisebach to *Albizzia Julibrissin*; but Macfadyen's detailed description is totally at variance with that tree, and agrees well with *Piptadenia peregrina*, to which also belongs the synonym he quotes, *Acacia angustiloba*, DC.

P. 400, Mimosa marginata.

Mimosa prostrata of the Berlin gardens has been now described as new by Regel in Descr. Pl. Nov. ii. 21 (from the Memoirs (Trudi) of the Imp. Bot. Gard. St. Petersb.), without comparing it with the *M. marginata*, and wrongly referring it to the *Castæ*.

P. 414, Mimosa guatemalensis.

Inga guatemalensis, Hook. et Arn. Bot. Beech., is by mistake quoted as *Acacia guatemalensis*.

P. 442, Leucæna Forsteri.

Acacia insularum (not *A. glandulosa*), Guillem. in Ann. Sc. Nat. ser. 2, vii. 360.

P. 458, after Acacia cedroides.

A. spondylophylla, *F. Muell. Fragm.* viii. 243. Patentim pilosula, viscidula. Phyllodia in verticillo plurima, 4–8 lin. longa, striato-rugulosa, apice recta. Pedunculi ad pollicem usque longi. Calyx tenuissimus, lobatus. Petala lævia. Legumen sessile, 1–1½-pollicare, 3–4 lin. latum, undulato-crispum, nec lignescens nec striatum.

Hab. Central Australia.

P. 461, after Acacia idiomorpha.

A. strongylophylla, *F. Muell. Fragm.* viii. 226. Stipulæ spinescentes phyllodiis æquilongæ. Phyllodia orbiculari-rhombea, ½–1-pollicaria, 1-nervia. Sepala libera, lineari-spathulata, corollæ trientem æquantia. Legumen (immaturum) stipitatum, lineari-oblongum, planum.

Hab. Central Australia.

P. 477, after Acacia setulifera.

A. minutifolia, *F. Muell. Fragm.* viii. 243. Tenuiter pubescens. Phyllodia glabra,

rhombeo-ovata, lateraliter rostellata, lineam longa, plurinervi-rugulosa. Calyx dentatus. Petala prominenter carinata. Legumen (immaturum) sessile, planum, 2–3-pollicare.

Hab. Central Australia.

P. 503, ACACIA SIEBERIANA.

Prosopis dubia, Guill. et Perr. Fl. Seneg. 242.

P. 557, CALLIANDRA HOUSTONI.

Anneslea falcifolia, Salisb. Parad. Lond. t. 64.

P. 562, ALBIZZIA LEBBEK.

Pithecolobium Splitgerberianum, Miq. ! Stirp. Surin. 5.

Acacia propinqua, A. Rich. Fl. Cub. i. 466 (var. foliolis subtus pubescentibus).

P. 564, after ALBIZZIA CANESCENS.

A. LITTORALIS, *Teijsm. et Binnend. in Nat. Tijdschr. Ned. Ind.* xxix. 259. Folia descripta fere *Albizziæ Lebbek* var. foliolis subtus pubescentibus. Capitula pauciflora, paniculata, floribus sessilibus *A. proceræ*. Legumen semipedale.

Hab. Amboyna.

This must be very near *A. procera,* but is perhaps specifically distinct.

P. 573, PITHECOLOBIUM UNGUIS-CATI.

P. guadalupense, Chapm. Fl. S. U. States, 116.

Besides the numerous variations in the form and size of the leaflets in different specimens of this species, those of the fruiting specimens have often a much more coriaceous aspect than those of the flowering ones.

NOTES ON PLATES LXVI. TO LXX.

These Plates are not intended to illustrate the pods characteristic of the several genera of Mimoseæ (for they would have been too numerous), but to show the great diversity exhibited, not only in one and the same genus, but even in some of the most natural subordinate groups.

Plate LXVI. exhibits the pods of twenty-two species of *Mimosa* and *Schrankia,* the two genera forming naturally a single one. Their chief common character consists in the unity of the prominent margin or rim. It neither splits into two with the valves, as in the case of most genera, nor separates transversely with the enclosed valves, as in the few species of *Acacia*, *Albizzia*, and *Pithecolobium* which have a more or less articulate pod. The seven species occupying the first row all belong to the section *Eumimosa* with isomerous stamens. *M. floribunda* is one of the commonest forms, although frequently more setose-aculeate, consisting usually of three or four very flat articles. *M. dolens* represents also the pod of a series of species, very convex, containing one or two seeds, and sometimes opening at the end only, the two articles scarcely marked; and sometimes even the rim appears to split at the end. The remaining five are monotypic, or nearly so. *M. desmodioides*, if seen alone, might, from its indumentum, as well as from its shape, be easily mistaken for a true *Desmodium*. *M. glabra* has the persistent rim nearly as broad as the enclosed valves, and the lines separating the articles are oblique, which I have not observed in any other species of the genus. *M. eriocarpa* and

M. furfuracea are like balls of wool, enclosing small, almost membranous pods, with one or two seeds, and are scarcely dehiscent. In the whole section there are very rarely above four seeds and articles, except in the six species forming the very distinct series *Spiciflorœ*, which might almost be regarded as a separate section, with the flowers of *Eumimosa*, the habit of *Schrankia*, and the pod of the subseries *Schrankioideæ* of *Habbasia*. One of them, *M. myriadena*, is figured in the lower row.

The remainder of the *Mimosa*-pods figured are those of the section *Habbasia*, characterized by diplomerous stamens, and the pods most frequently, but not always, with more than four seeds and articles. The thin membranous pod of *M. acantholoba* and *M. platycarpa*, the thick, convex, setose ones of *M. brachycarpa* and *M. Clausseni*, the rigid ones of *M. flexuosa* and *M. adversa*, and the flat, shining, rather coriaceous, reticulate ones of *M. andina* do not break up transversally, and belonged to the section formerly distinguished on that account under the name of *Ameria*; but as the fruits of more species become known, the distinction proved too artificial to be kept up. In *M. borealis*, *M. dysocarpa*, and a few others the valves fall away from the rim entire or broken into articles in the same specimen; and some species, with the reticulately veined pod of *M. andina*, when quite ripe, have occasionally the transverse fissures between the seeds irrespective of venation. *M. acantholoba* and *M. platycarpa*, with almost identical pods, differ very much in habit and inflorescence, that of the one being globose-capitate, that of the other a long and slender spike.

The two *Schrankiæ* figured at the end of the last row do not differ as to the pod from *M. Clausseni*, except in its proportionate length and breadth. In habit they are widely removed from that species, but closely resemble *M. Selloi*, and still more *M. invisa* (not here figured), both of which, as well as some others, had been presumed to be *Schrankiæ* till the pod became known. *Schrankia platycarpa* is, indeed, almost as much a *Mimosa* as a *Schrankia*, and the latter genus is still retained more as a matter of convenience than on strictly scientific grounds.

Plates LXVII. and LXVIII. represent the pods of twenty-six out of above 270 species of Australian Phyllodineous Acacieæ, one of the most natural groups among Mimoseæ, which it has been found hitherto impossible to break up into good natural sections, and which have therefore been divided artificially, according to inflorescence and venation of the phyllodia, into series which have no relation to the extraordinary diversities in the fruit; nor have the differences observable in the calyx and corolla been in any degree more connected with the variations in the pod. The species figured in Plate LXVII. have all globose-capitate flowers; in those of plate LXVIII. the spikes are cylindrical or elongated, with the pods equally variable in both, without any general character attributable to either except that they are more frequently thickly coriaceous, turgid, or almost woody in the *Spicatæ* than in the *Capitatæ*. Both series afford examples of the spirally twisted pod, the spire turning from right to left or from left to right in the same specimen, or even in the same pod; the three figured have very little in common either in their phyllodia, inflorescence, calyx, or corolla. Many of the species have the seeds imbedded in, or separated by, a pithy substance, as in the *Vachellia* series of the *Gummiferæ*; but others, again, whether with thin, flat and papery, or turgid or thick and

woody valves, are entirely without the pith or pulp; and in no case can the nature of the pod be safely guessed at from the examination of a flowering specimen.

Plates LXIX. and LXX. represent some of the pods of a series as natural as that of the *Phyllodineæ*, the *Gummiferæ*, of which the majority are African but are also represented in Asia and America. Among these, *A. farnesiana* (Pl. LXIX.) has been frequently proposed as a distinct genus, under the names of *Vachellia*, *Farnesia and Aldina*, on account of the seeds, although at first normally arranged, becoming, as the pod advances towards maturity, irregularly imbedded in a pithy substance filling the turgid pod. A similar arrangement will be observed in *A. giraffæ*; and the pithy substance, although with a more regular arrangement of the seeds, is developed in *A. macracantha* and a few others, all of which agree also in the little annular bract under the flower-head being at the summit of the peduncle, instead of in the middle or lower down. This, however, appears quite insufficient to constitute a genus when there is nothing to distinguish it in habit, foliage, inflorescence, flowers, or seeds; for the pods of *A. macracantha* show an approach to those of *A. arabica* (erroneously placed by Grisebach in *Vachellia*, for they are not pithy between the seeds); the pithy substance occurs in many Australian *Phyllodineæ* without any corresponding differences. It would be, moreover, very unnatural to place in two different genera *A. giraffæ* aud *A. hebeclada* (figured immediately under it), two species very similar in every respect, even in the thick, turgid, oblong pod, merely on account of the pith, abundant in the one and absent in the other.

For the *A. macracantha*, with turgid pods pithy inside, and *A. arabica*, with flat, though thickly coriaceous pods continuous inside, I have figured several specimens, showing the gradation from the deeply indented to the straight-edged forms observable in both species, differences which have induced many botanists to distinguish two species in the *A. arabica*; but in the numerous specimens I have now seen from various parts of the wide area of the species, I have observed several intermediates between any two of the four forms figured, and in one borrowed specimen, returned before these plates were drawn, one half of the pod was deeply indented and the other half quite continuous. The pod of *A. macracantha* varies, moreover, from flat to almost cylindrical—in the former case, however, usually dried before it is fully ripe.

In Plate LXX. the first three pods of the upper half have their valves thick and somewhat succulent, so that *A. albida*, seen without the flowers, has been more than once taken for a *Prosopis* with exceptionally exalbuminous seeds. In the lower half the pods of *A. latronum* and *A. abyssinica* are quite flat, but coriaceous; in *A. clavigera* and *A. nubica* the valves are convex; in *A. eburnea* from India, and *A. constricta* from Texas, the pods closely resemble those of a large proportion of Australian *Phyllodineæ*.

I have not figured any of the *Acaciæ Vulgares*; for the pods are much more uniform, generally flat and straight, sometimes like those of *Albizzia*, but usually not so broad, more coriaceous, and more readily dehiscent, and often undistinguishable from those of *Piptadenia*, of which the flowers are so different. The exalbuminous seeds readily distinguish them from the otherwise similar fruits of *Leucæna*.

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FOR

PLACING THE PLATES

OF

THE THIRTIETH VOLUME.

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END OF THE THIRTIETH VOLUME.

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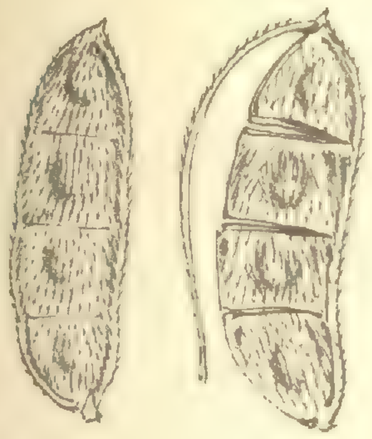


M. FLORIBUNDA

M. DOLENS

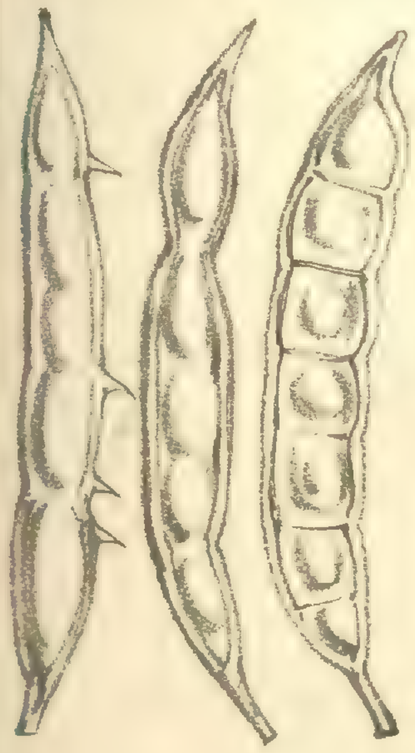
M. DESMODIOIDES

M. ADPRESSA

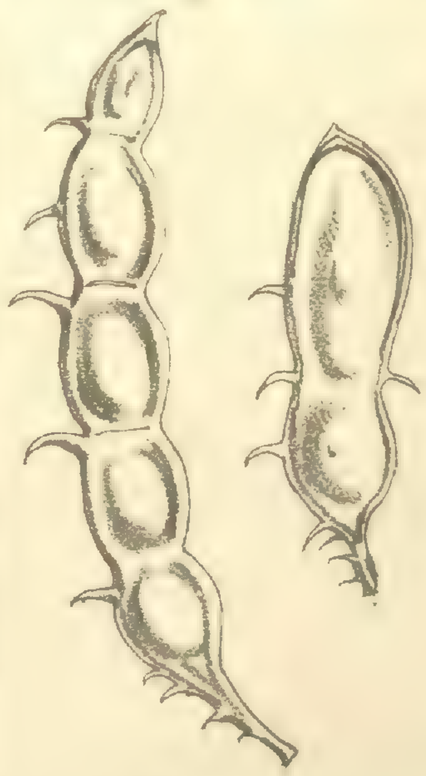
M. GLABRA.

M. ERIOCARPA

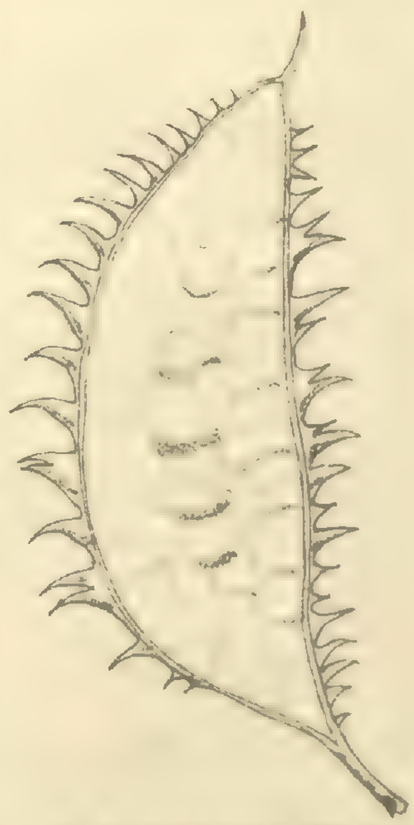
M. FURFURACEA.



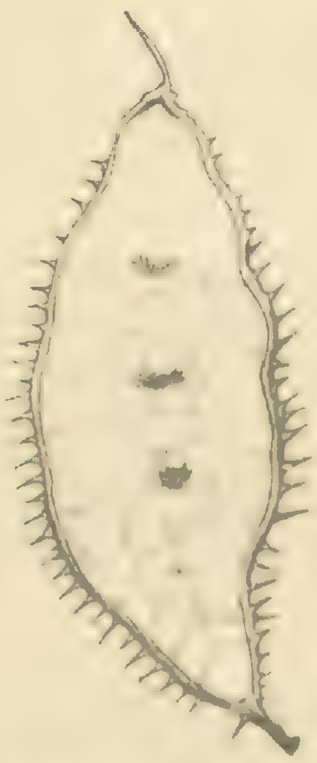
M. DYSOCARPA.



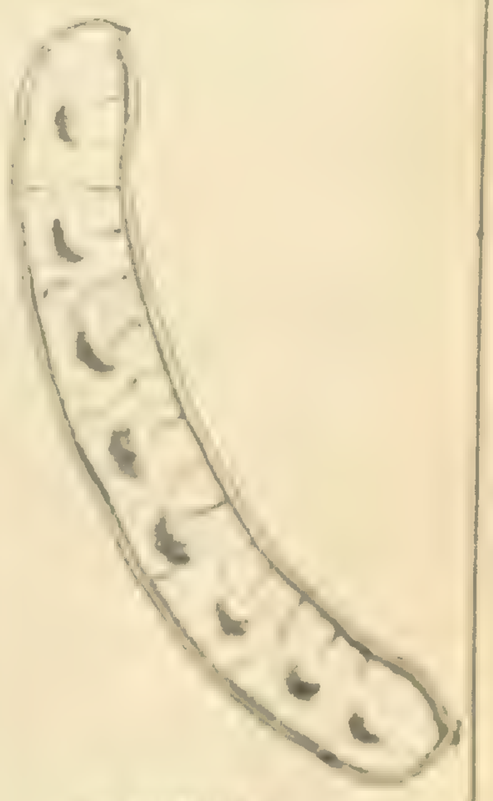
M. BOREALIS.



M. ACANTHOCARPA

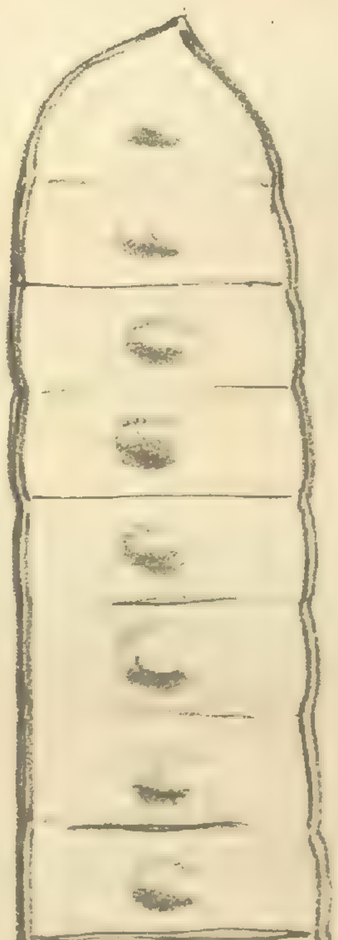


M. PLATYCARPA

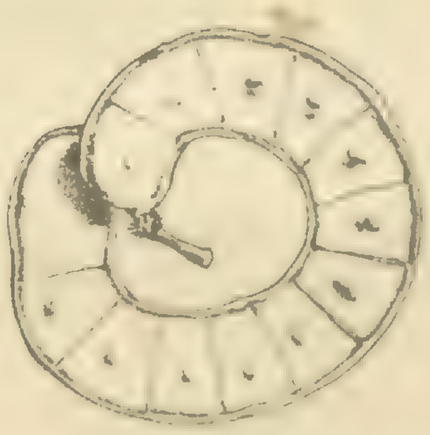


M. ANDINA

M. MYRIADENIA.



M. SPRUCEANA.



M. ANNULARIS

M. FLEXUOSA.

M. ADVERSA

M. BRACHYCARPA

M. CLAUSSENI

M. SELLOI.

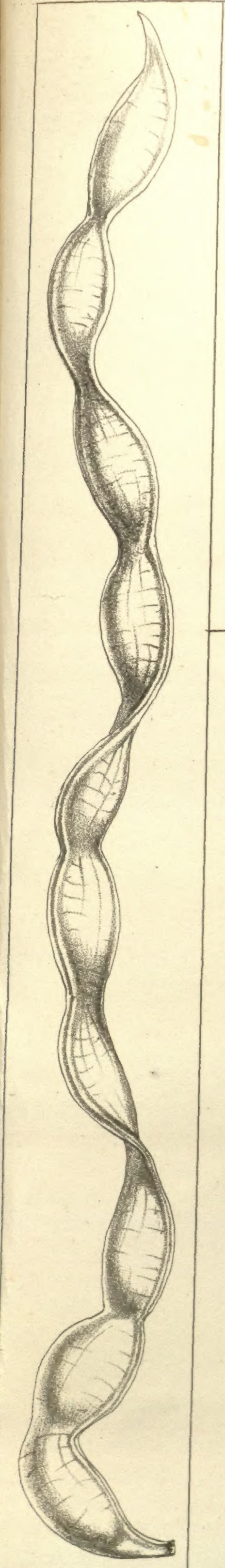
M. PLATYCARPA

M. UNIJUGA.

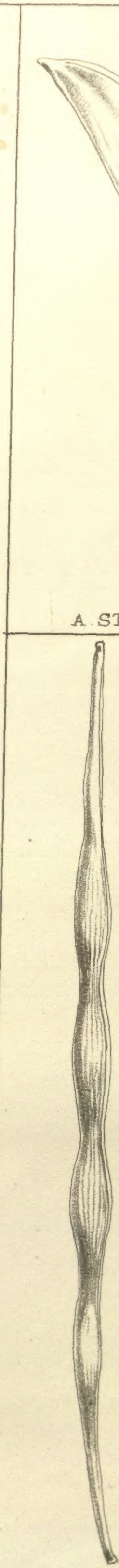
Fig. 66

Hatch lith

Pods of Mimosa and Schrankia



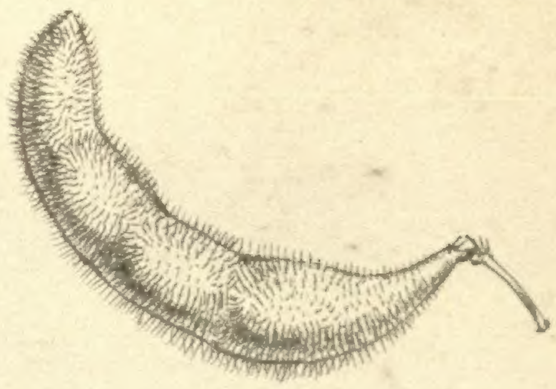
A. LANIGERA.



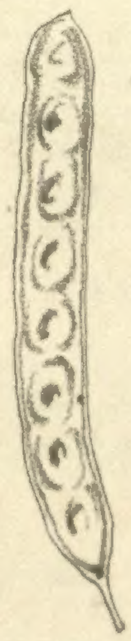
A. SCIRPIFOLIA.

A. STENOPTERA.

A. TRINERVIA.

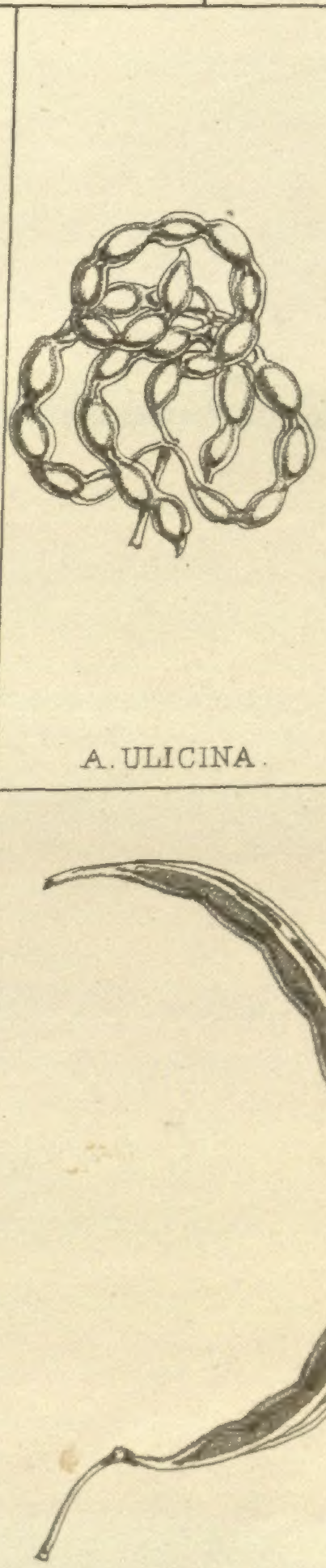


A. ALATA.

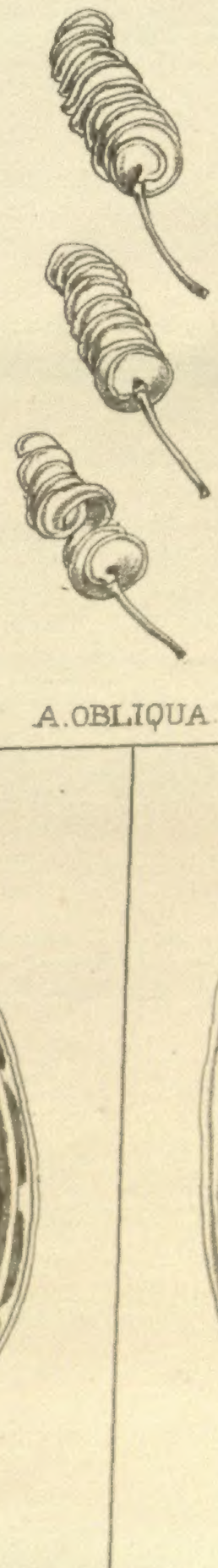


A. SICULIFORMIS.

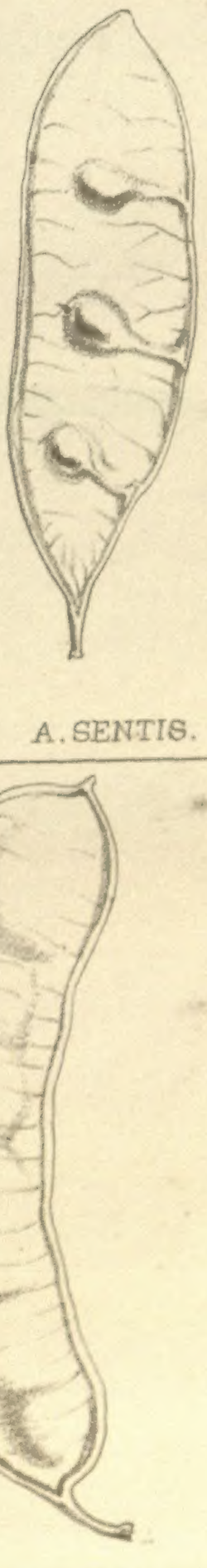
A. QUADRISULCATA



A. ULICINA.

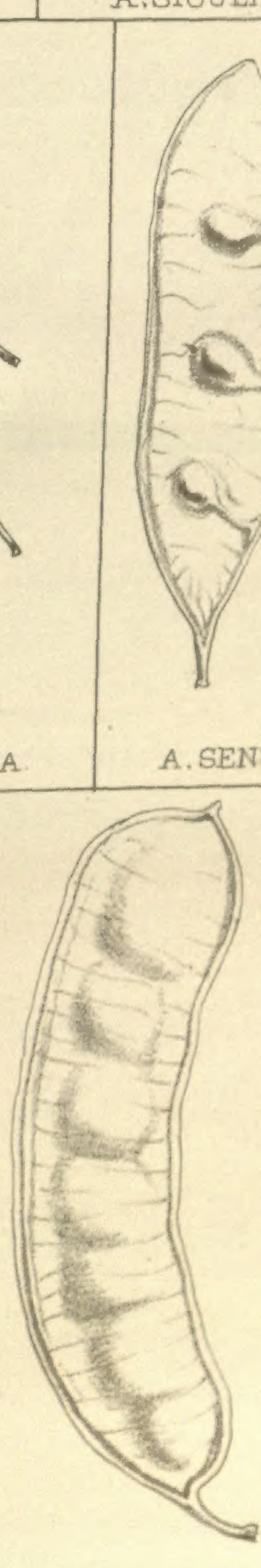


A. OBLIQUA.

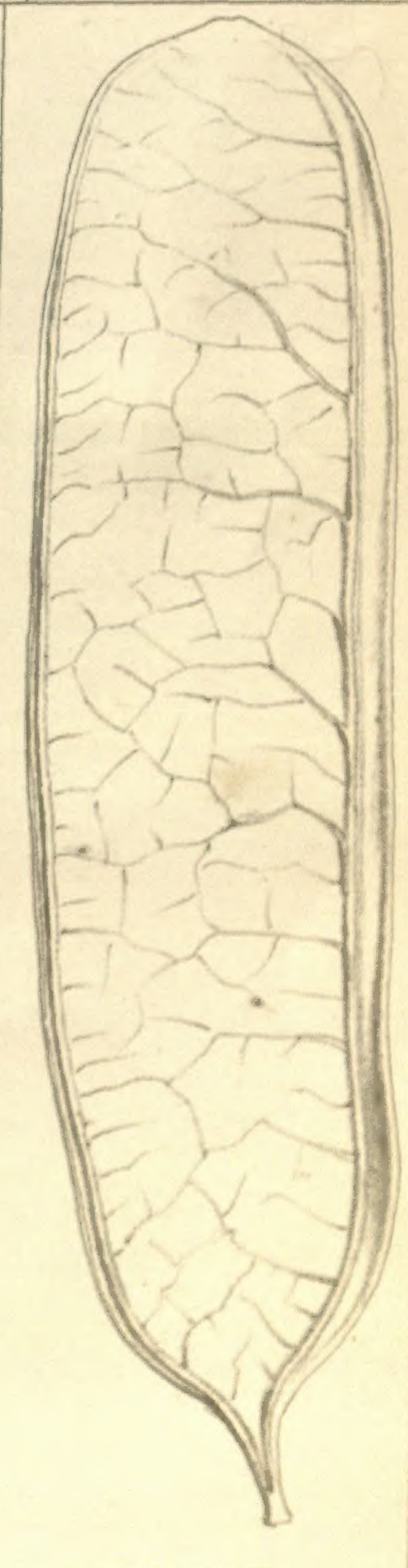


A. SENTIS.

A. CUNEATA.



A. UNDULIFOLIA.



A. SERICATA.

Fitch lith.

Fitch imp

Pods of Acaciae Phyllodineae Capitatae.

A. TUMIDA.

A. DREPANOCARPA.

A. XYLOCARPA.

A. LONGIFOLIA.

A. LIMBATA.

A. COCHLIOCARPA.

A. ANEURA.

A. JULIFERA.

A. TORULOSA.

A. GLAUCESCENS.

A. CRASSICARPA.

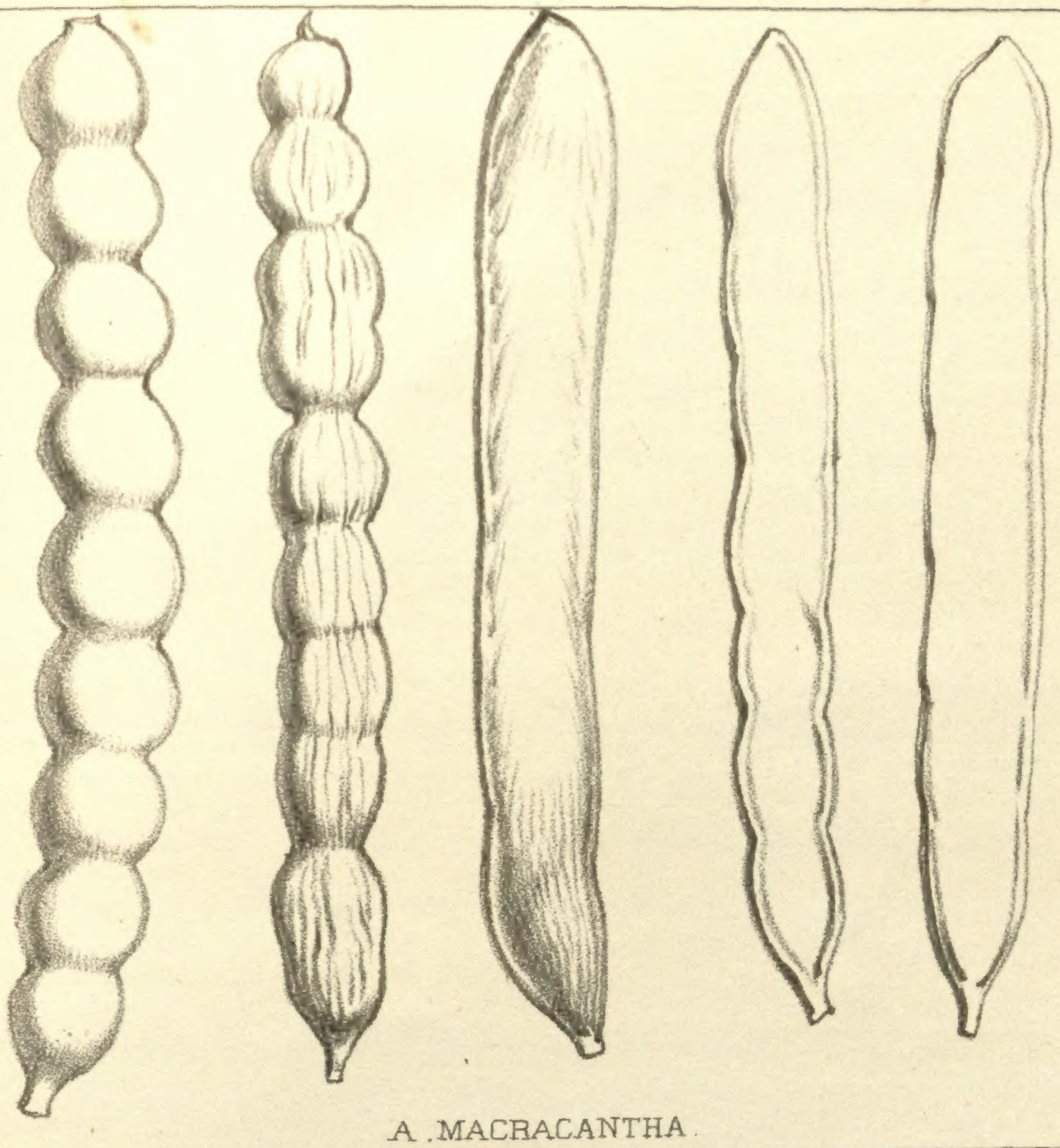
A. AURICULIFORMIS.

A. HOLOSERICEA.

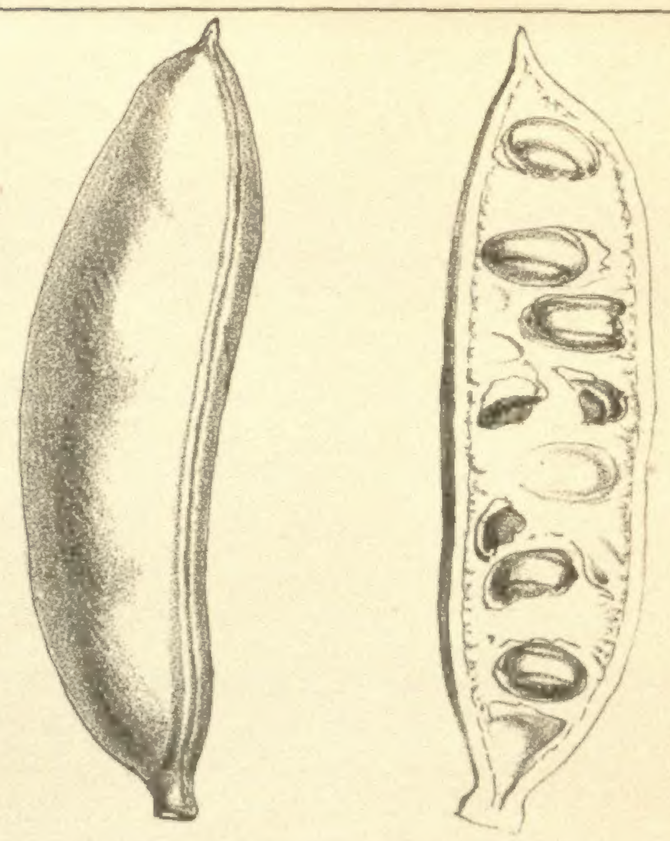
Fitch lith.

Fitch imp

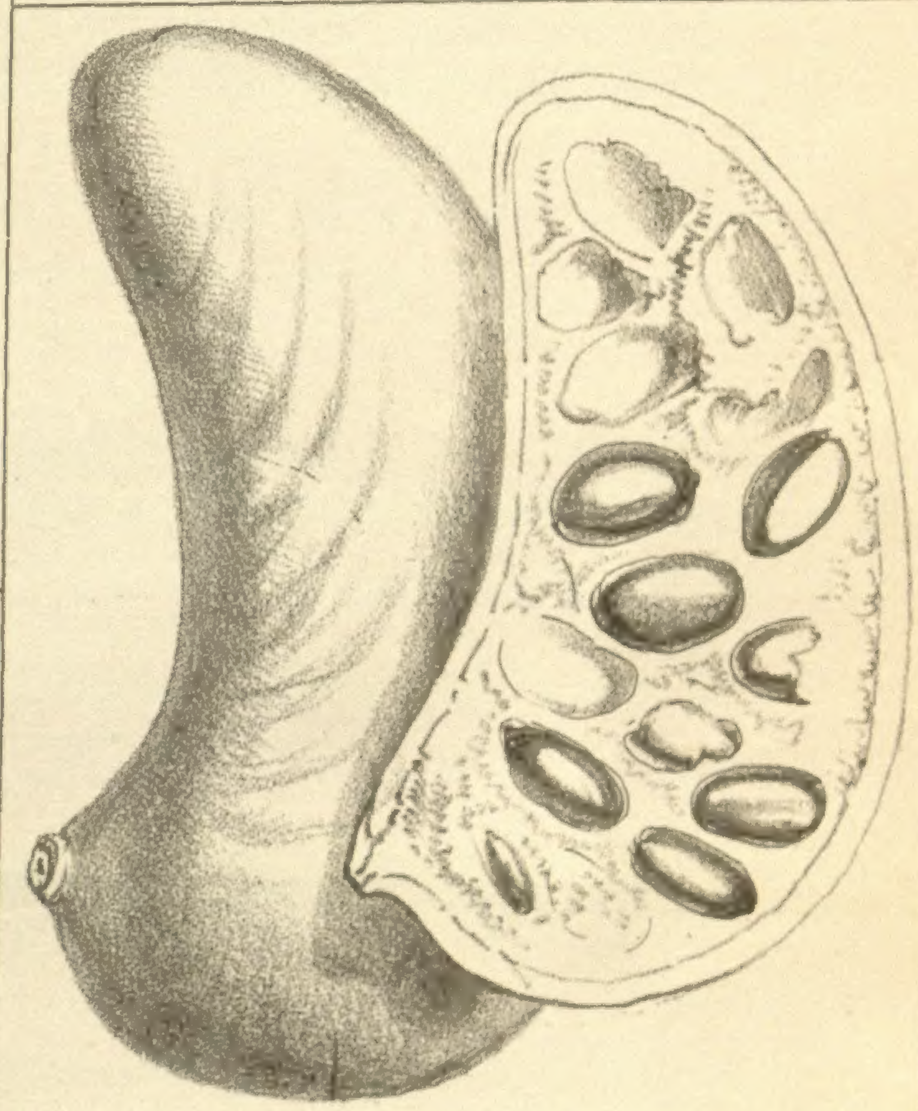
Pods of Acaciae Phyllodineae Spicatae



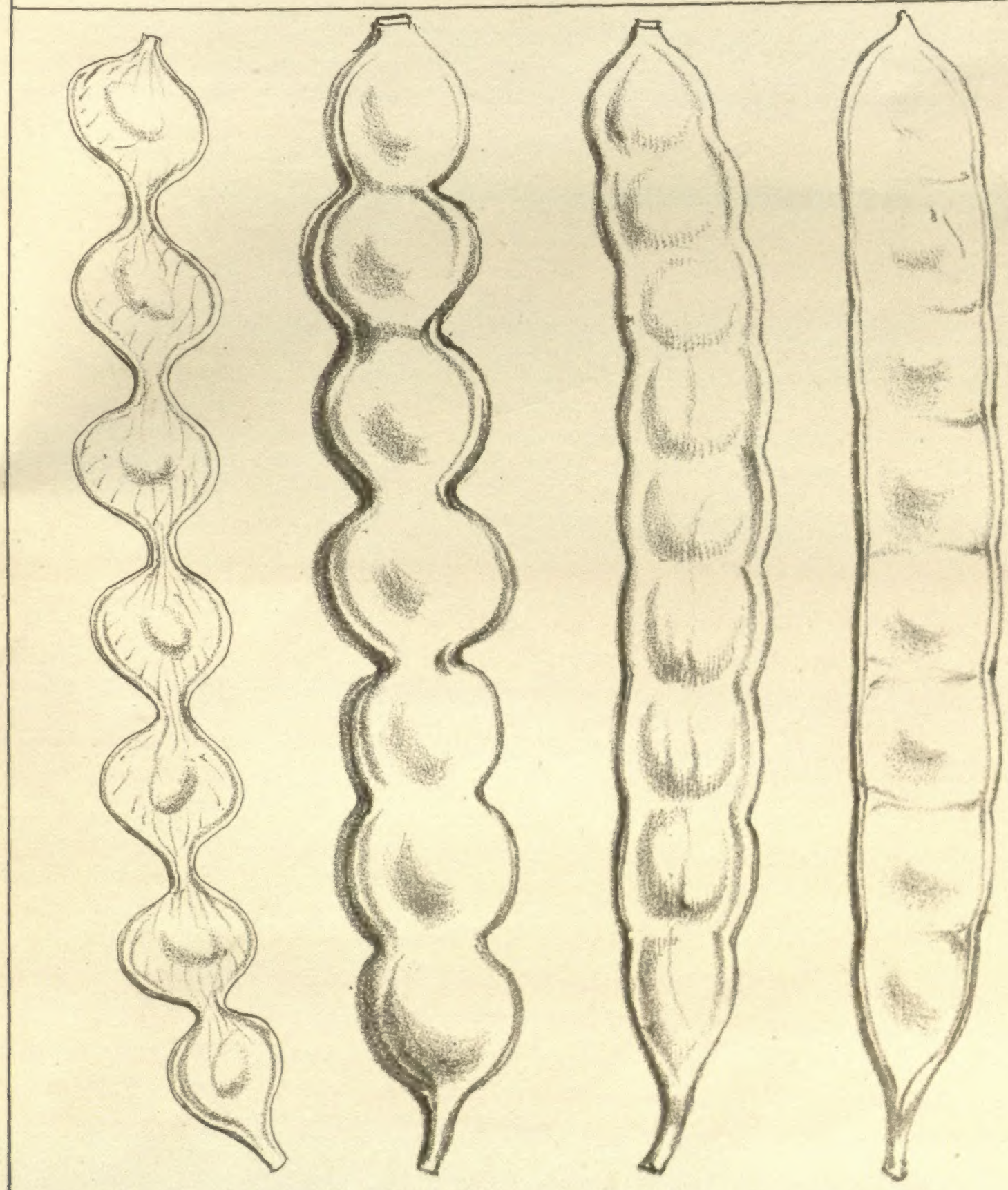
A. MACRACANTHA.



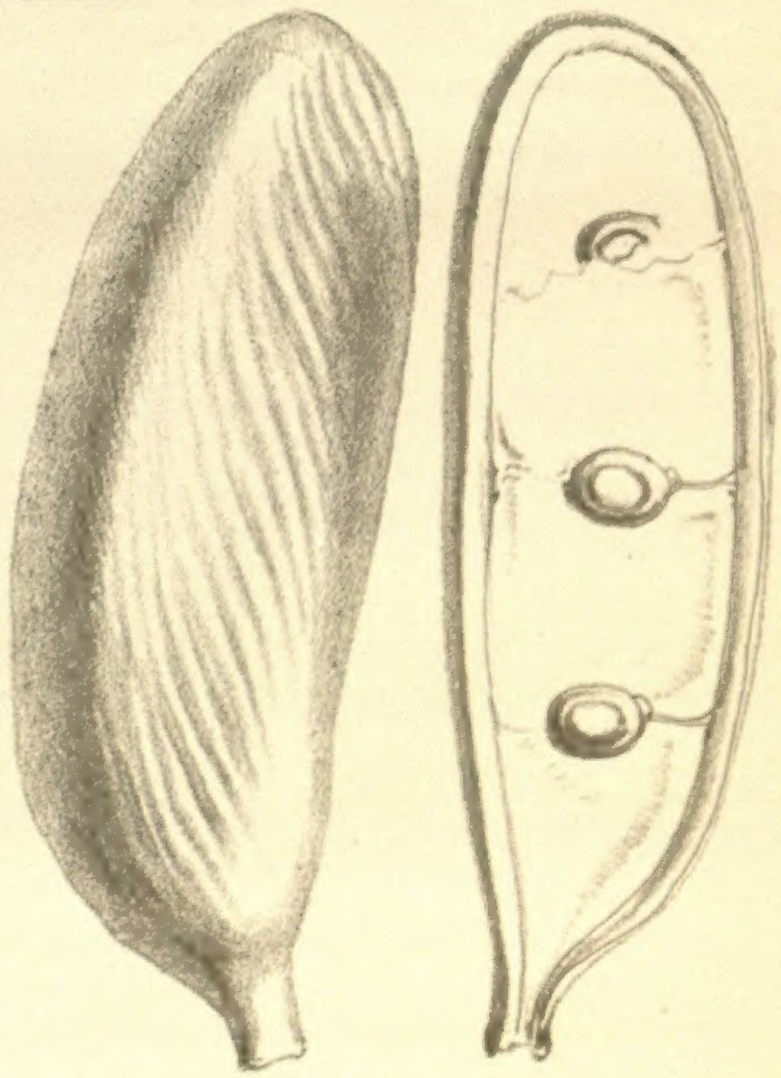
A. FARNESIANA.



A. GIRAFFÆ.



A. ARABICA.



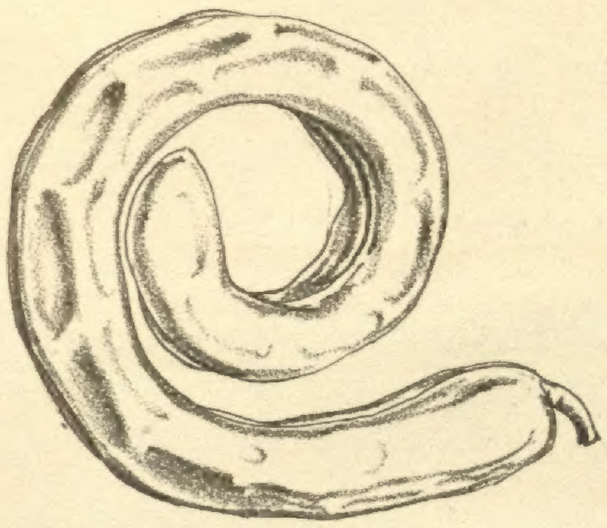
A. HEBECLADA.

Fitch lith.

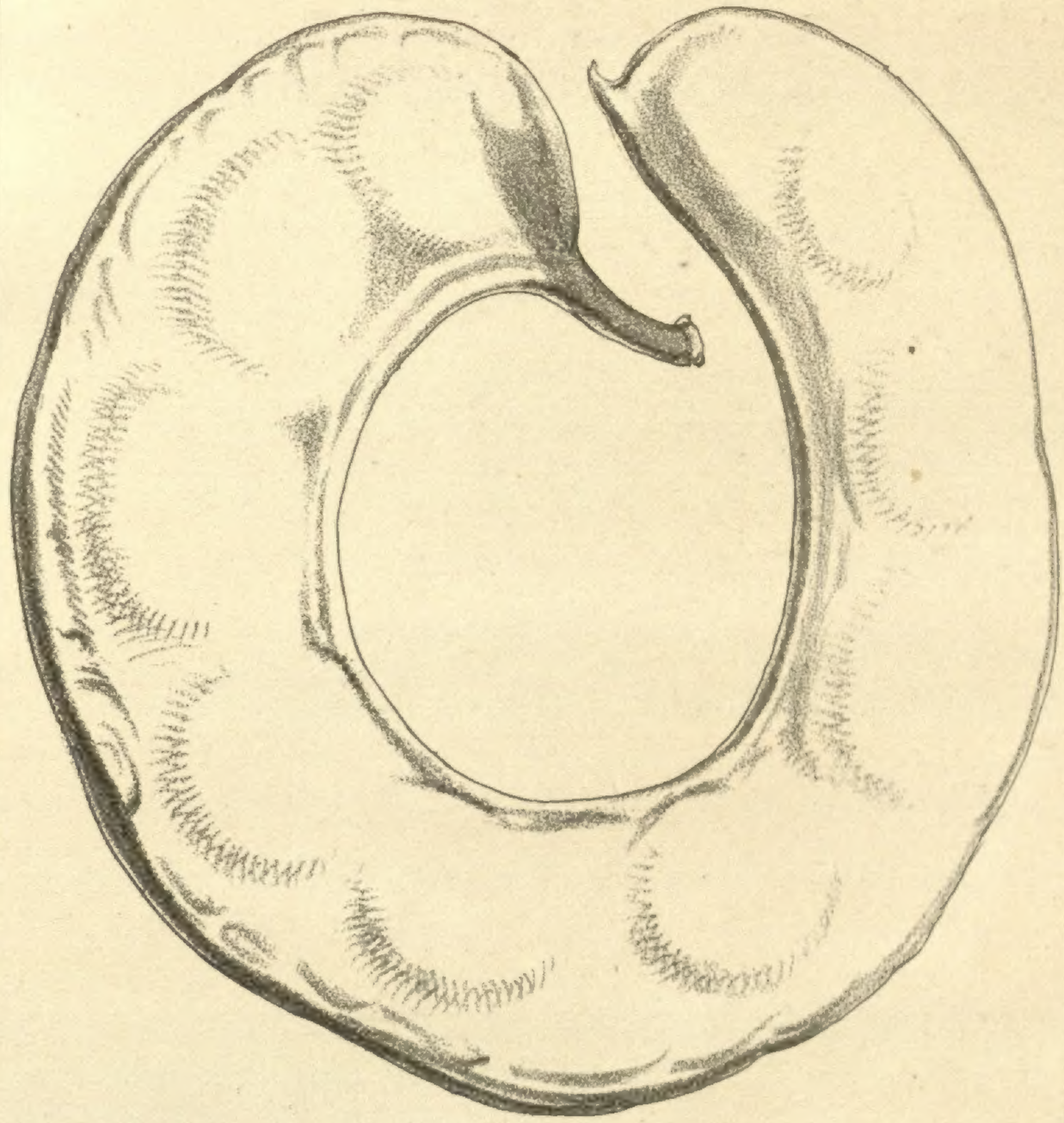
Fitch imp

Pods of Acaciaê Gummiferaê.

A. LITAKUNENSIS.



A. PLANIFRONS.



A. ALBIDA.

A. TOMENTOSA.

A. LATRONUM.

A. CLAVIGERA.

A. ABYSSINICA.

A. NUBICA.

A. EBURNEA.

A. CONSTRICTA.

Fitch Lith.

Fitch imp.

Pods of Acaciae Gummiferae.